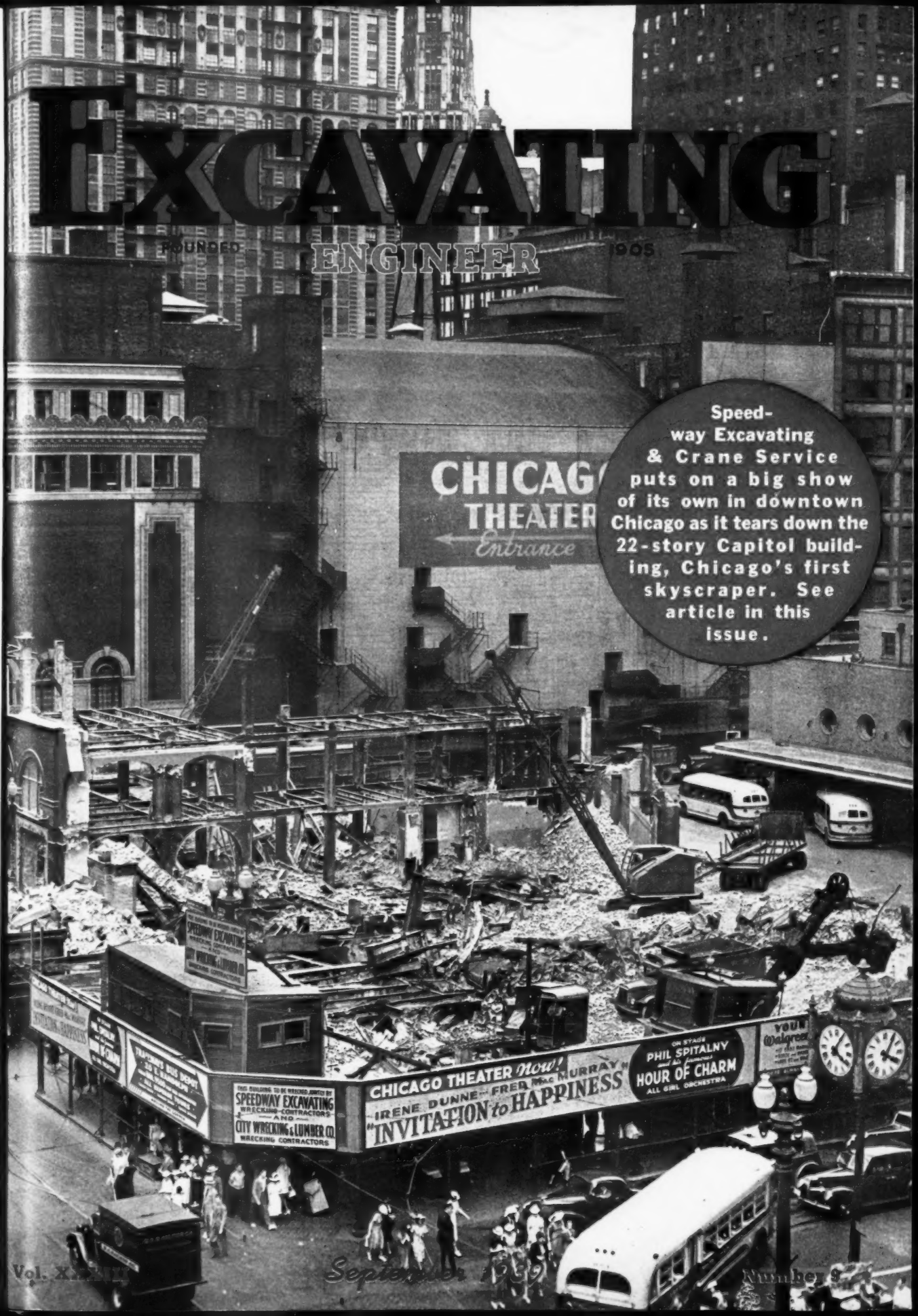
EXCAVATING
ENGINEER
FOUNDED 1905
Speed-way Excavating & Crane Service puts on a big show of its own in downtown Chicago as it tears down the 22-story Capitol building, Chicago's first skyscraper. See article in this issue.
CHICAGO THEATER
Entrance
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CITY WRECKING & LUMBER CO.
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"INVITATION to HAPPINESS"
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HOUR OF CHARM
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Vol. XXXIII
September
Number 9

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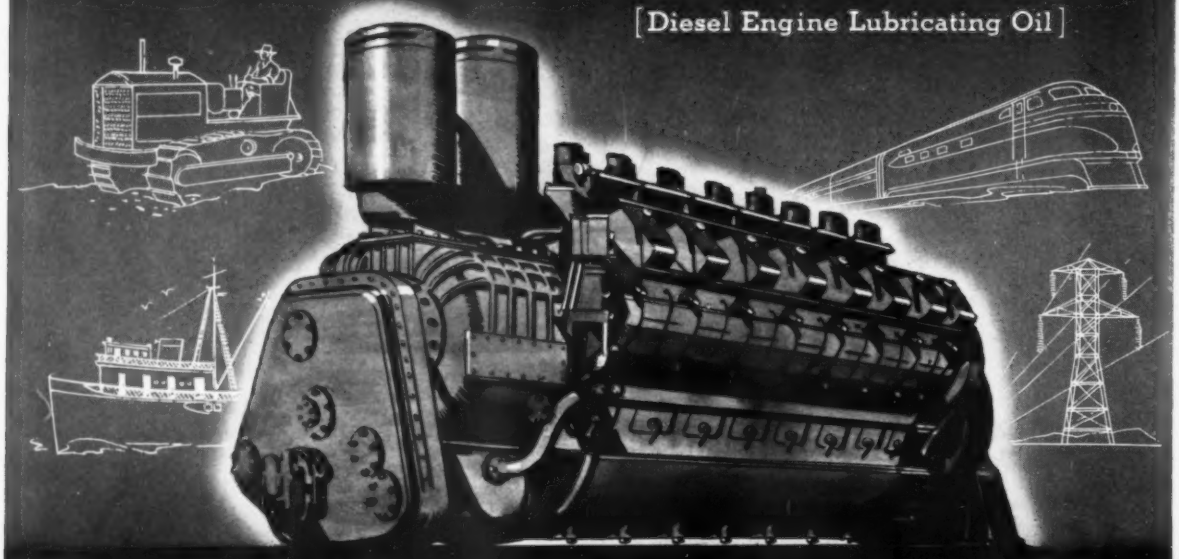
[Diesel Engine Lubricating Oil]



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STANDARD OIL COMPANY OF CALIFORNIA

EXCAVATING ENGINEER

FOUNDED 1905

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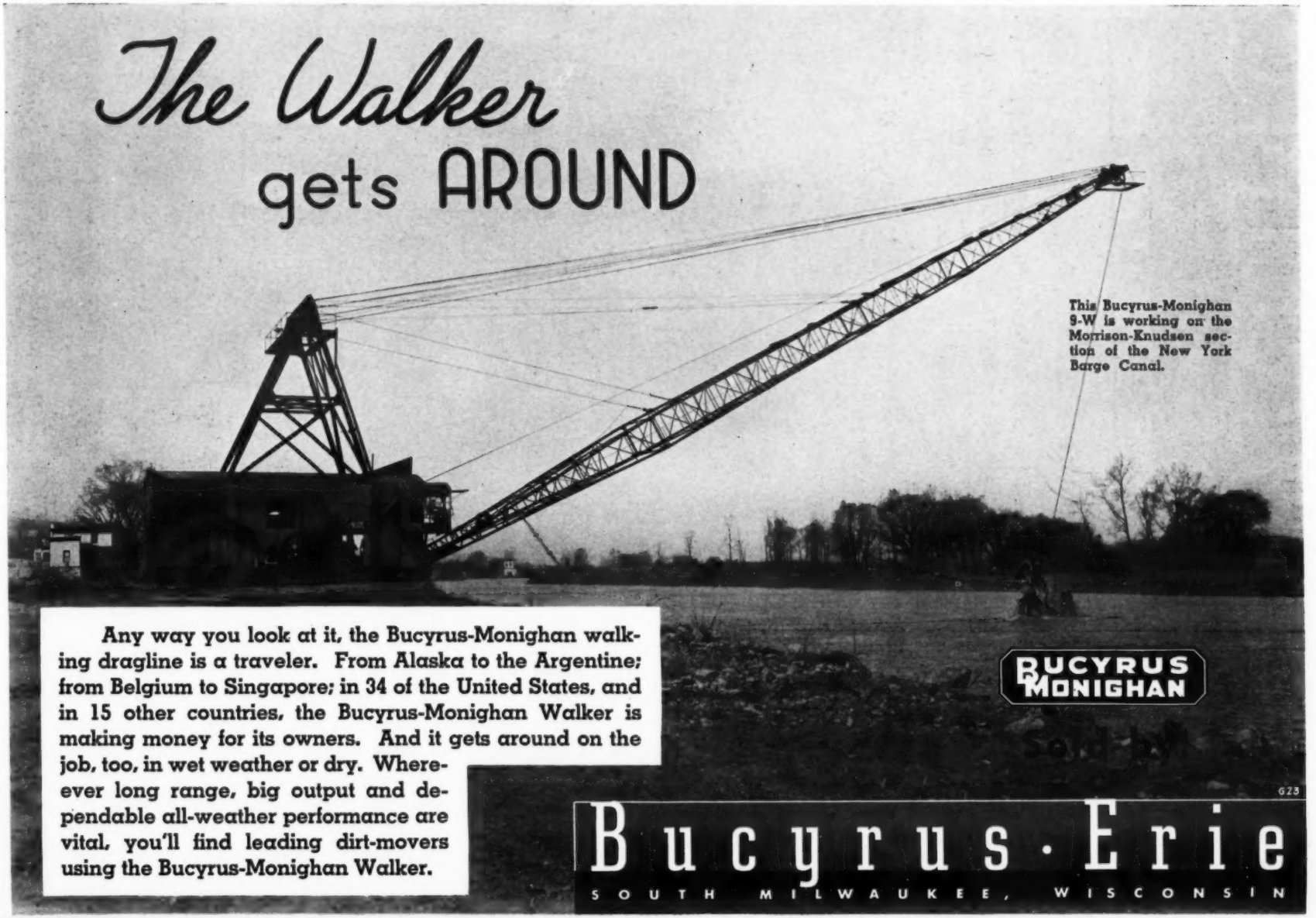
The Walker gets AROUND



This Bucyrus-Monighan 9-W is working on the Morrison-Knudsen section of the New York Barge Canal.

Any way you look at it, the Bucyrus-Monighan walking dragline is a traveler. From Alaska to the Argentine; from Belgium to Singapore; in 34 of the United States, and in 15 other countries, the Bucyrus-Monighan Walker is making money for its owners. And it gets around on the job, too, in wet weather or dry. Wherever long range, big output and dependable all-weather performance are vital, you'll find leading dirt-movers using the Bucyrus-Monighan Walker.

BUCYRUS MONIGHAN

G23

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SOUTH MILWAUKEE, WISCONSIN

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BUCYRUS ARMSTRONG
27-T
H-17

BUCYRUS-ERIE COMPANY
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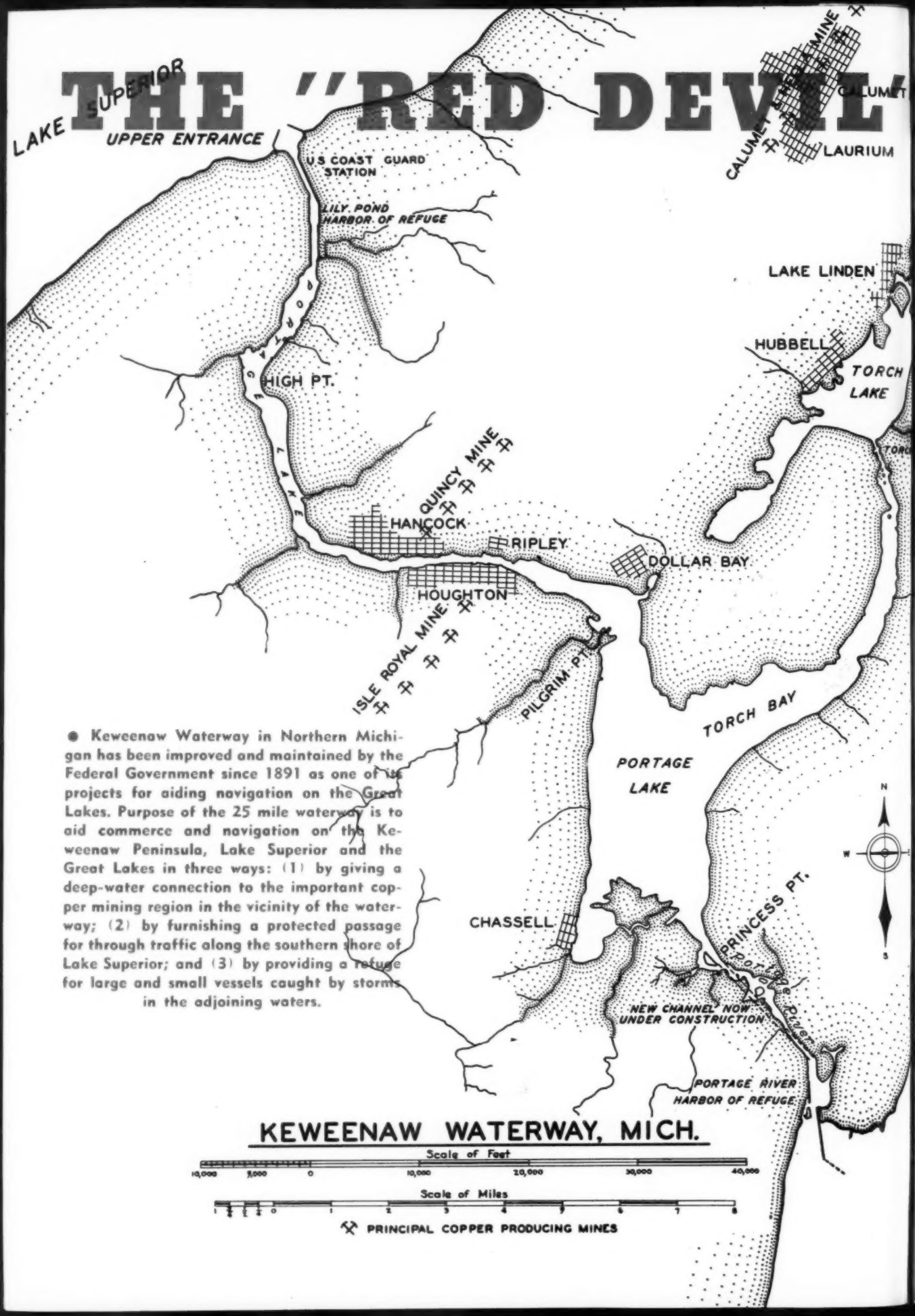
THE "RED DEVIL"



● Keweenaw Waterway in Northern Michigan has been improved and maintained by the Federal Government since 1891 as one of its projects for aiding navigation on the Great Lakes. Purpose of the 25 mile waterway is to aid commerce and navigation on the Keweenaw Peninsula, Lake Superior and the Great Lakes in three ways: (1) by giving a deep-water connection to the important copper mining region in the vicinity of the waterway; (2) by furnishing a protected passage for through traffic along the southern shore of Lake Superior; and (3) by providing a refuge for large and small vessels caught by storms in the adjoining waters.

KEWEENAW WATERWAY, MICH.

Scale of Feet

10,000 5,000 0 10,000 20,000 30,000 40,000

Scale of Miles

1 0 1 2 3 4 5 6 7 8

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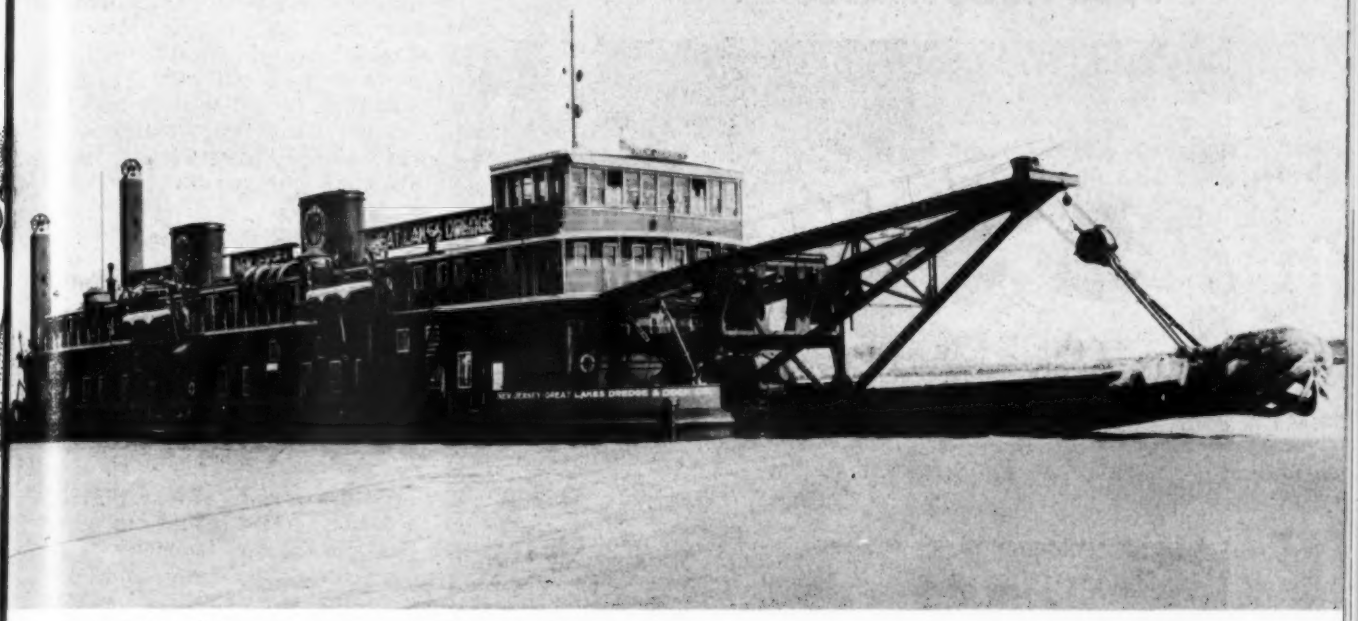
DOES THE JOB



"New Jersey," ace dredge of the Great Lakes Dredge and Dock Company, handles a tough assignment in the upper entry of Keweenaw Waterway on Lake Superior.

By FLOYD SUTER BIXBY

THE 18-INCH hydraulic dredge "Alice Vivian" lay alongside the Lily Pond mooring pier in the upper entry of Keweenaw Waterway, Michigan, one stormy October night in 1936. A heavy sea lashing in from Lake Superior had roughed her sides and snapped a spud. Her cutter shaft lay in two pieces on her weatherbeaten deck, broken when the dredge rooted too deep in a nest of granite boulders and hardpan. Pacing the mess hall floor on the second deck, Captain G. V. Carlson, her Scandanavian skipper, listened ruefully to the wind and sleet howling in off the lake.

Two months earlier, the U. S. Engineers awarded the Zenith Dredging Company of Duluth, Minnesota a contract for dredging 2,000,000 cubic yards of material from the upper entry of the waterway. Carlson thought the "Alice Vivian" could do the job. For more than a decade he had skippered the dredge for Zenith and he knew every part of her by heart. He knew her capabilities, but after two months of cutting and pounding material that seemed as solid as a stone wall, the veteran dredgemaster admitted he was whipped so far as the "Alice Vivian" was concerned.

Zenith Decides to Let Sub-Contract

Only two solutions seemed logical to Captain Carlson. He might recommend to the Zenith Company that a new dredge be built especially for the job. Or the contract might be sublet to some contractor having powerful equipment better suited for the job of removing boulders and hardpan. When the latter alternative was selected, Carlson berthed the "Alice Vivian" at nearby Hancock, Michigan and settled down to a long winter of waiting for the arrival of the super dredge coming up from the lower lakes to do the work.

A sub-contract was awarded to the Great Lakes Dredge and Dock Company of Chicago, Illinois, and officials of that company selected their ace dredge, the 30-inch Diesel-electric "New Jersey" to do the job.

To stand the task of removing hard, set material from the harbor entrance, it was certain that the dredge must be absolutely a brute for punishment. Plans for the harbor called for a project depth of 32 feet in the approach channel and outer harbor outside the breakwater, for 30 feet inside the stilling basin, and for 28 feet in the widened channel leading into the Lily Pond Harbor of Refuge.

A Tough Assignment

Hardpan and cemented sand had to be cut loose, granite boulders up to 20 inches in diameter and weighing hundreds of pounds had to be lifted 15 feet or more and pumped through pipeline that at times stretched 5,000 feet across the bay. Ranging 600 feet down the eastern shore of the canal to be widened was a bank 50 feet high, measured from the top to project depth. The dredge must be capable of nosing her cutter into this bank and pumping a cut

● Top: A close up of the "New Jersey's" cutting head. A dipper dredge is in background. Center: Cutting a vertical bank near the surface in hard material. Bottom: Material gouged out by the cutting head is pumped through 5,100 feet of pipeline to this dump area. Note large size of stones.

deep enough to float her over the primary shoal.

For the difficult work conditions imposed, many arguments arose during the long winter. Dredge personnel stationed in Hancock doubted if any hydraulic dredge, however well constructed, could stand the terrific beating and vibration that was transmitted through the "Alice Vivian" when she stuck her nose into that hard material. Old dredgemen who swore by wooden hulls said the same force which opened up the seams of the oak-hulled Zenith dredge would spring the rivets in the steel hull of the "New Jersey." The consensus was that the job was meant for a dipper dredge and should have been bid as such.

Arrival of the "Red Devil"

On the morning of May 19, 1937 a curious crowd turned out when the "New Jersey" under tow of the Great Lakes Dredge and Dock Company tug "Cushing" passed Hancock, Michigan and saluted the crippled "Alice Vivian" with a blast of her air whistles as she swept gracefully up the narrow channel past the city. At the sight of her, all doubt that she was capable of doing the job was dispelled then and there. This freshly painted red monster, hailed as the largest dredge of her type in the world today, glistened for a space of 245 feet down her squat deck. The dredgemen who lined the dock could only whistle and exclaim "Boy, what a dredge that one is!"

For a week the "New Jersey" lay along the Lily Pond mooring pier while her crew of 77 men prepared for the job. A shore crew mobilized the 30-inch pipeline and joined the scows supporting the pipe. The dredge crew made last minute adjustments to the machinery and dumped 20,000 gallons of fuel oil into her hold.

On the morning of May 25, 1937, the "New Jersey" eased away from the pier, towed by the "Cushing" and a small service tug. Together, they jockeyed her into position at a point in the middle of the stilling basin, where the "Alice Vivian" had taken her beating the year before. One range for the center line of the

(Continued on page 531)

LOWERING CHICAGO'S *Skyline*

Razing 22 stories of glass, stone, and steel in 59 days, Speedway Excavating & Crane Service sets a record in the demolition of Chicago's first skyscraper.

By S. D. MYSLIS

DOWNTOWN Chicagoans were just as curious as their country cousins when they saw a familiar land mark start to disappear before their very eyes under the efforts of the Speedway Excavating & Crane Service of Chicago.

Once the tallest skyscraper office building in the world, the 22-story Capitol Building located at State and Randolph streets was built in 1891 at a cost of $2,000,000. During the 1893 Chicago World's Fair it was a mecca to hundreds and thousands of sightseers.

Rising Taxes Force Razing

Principal reason for the demolition of this building which was still in good condition is an endeavor by building owners to meet rising taxes and operating costs with an income rapidly being lowered by the competition of more modern buildings. The decisive factor in the razing of the Capitol Building was the prospective burden of $100,000 for caissons to replace the building's original floating foundations in order to accomodate proposed subway construction near the building's site.

The razing of the old Capitol Building is a spectacular example of the present trend of owners of tall, obsolete structures towards replacing them with low, lighter taxed buildings. Although official statistics are not available it is known that more cubic yards of old structures have been wrecked than have been put up by builders in the last few years. Wreckers and excavators are beginning to

● Cleaning out a tangled, heavy debris of girders, cables, mesh, and granite blocks after the last four floors were collapsed.

● A graphic, week by week, story of the 59-day demolition of Chicago's first skyscraper. From the first view, lower left, taken on May 6 the pictures show the progress of demolition on May 13, June 3, 13, 23, and 24. Note the protective apron that was used during the razing of the upper floors.

● Speedway Excavating's big show on State and Randolph streets ran continuous for nearly two months and was a crowd stopper. Although the work was carried on 24 hours a day at record speed in crowded conditions, careful workmanship and ample barricades resulted in no injuries to workmen or pedestrians.

● The wrecking completed, a basement excavation is being dug for the new two-story building to come.

enjoy an increasing patronage in this type of work.

Worked Three 8-Hour Shifts

Razing of the building was started May 2 and from then on Speedway Excavating kept up a continuous sequence of operations working three 8-hour shifts a day to meet its 60-day penalty contract. The contract called for a $500 bonus for each day chalked up ahead of schedule with a $700 a day penalty for each day over the 60-day schedule.

Employing protective aprons which were installed four stories below operations and reset every four stories, the upper floors were demolished by two derricks equipped with 100 foot booms. When the building was razed to the fourth story the last four floors were collapsed to fall as rubbish to basement level.

At this point the Speedway excavating equipment swung into action. Three Bucyrus-Erie Diesel powered machines (Models 19-B, 22-B, and 37-B) were used in finishing up the demolition. Tearing apart a tangled, heavy debris of girders, cable, mesh, and granite blocks meant tough digging but the fast biting Diesel shovels kept the six-wheel 15-yard Macks, Autocars and Whites rolling.

A Bucyrus-Erie crane swinging a 2½ ton skullcracker proved to be a very handy unit for collapsing walls and floors, doing work in 20 minutes that would take 15 men about half a day with sledge and pick.

Admirable Safety Record

It is interesting to note that despite the speed of continuous operations that were necessary to meet the contract time and the crowded conditions of the scene of operations not one accident occurred. For this remarkable record Speedway Excavating received a congratulatory letter from Michael J. Corrigan, Chicago Fire Commissioner.

Physical condition of the steel and concrete filled I-beams was excellent and about 85% will be sold to salvagers for smaller buildings. Removal of the old foundation was handled by the 37-B. Speedway Excavating also has the sub-contract for the excavation for the ultra modern 2-story building being erected on the site for the owners by John Griffiths & Son Co.

Completing their contract on June 29 Speedway Excavating and City Wrecking finished their 60-day show one day ahead of schedule, and a 48 year old landmark is missing from Chicago's skyline.

● Swinging a 2½ ton "skullcracker" this truck mounted Universal crane caves in a building wall.

Fast Work
ON A HARD JOB

The Callanan Road Improvement Company works through the winter months to speed revision of the New York Barge Canal through 4.2 miles of tough digging.

By SPENCER JONES

WIDENING AND deepening 4.2 miles of the New York State Barge Canal through earth, boulders and ledge rock may not seem very difficult, but try it in the dead of winter with a foot or so of ice and snow over everything. Or try it while flood waters are breaking into the supposedly dry canal and filling acres of freshly drilled blast holes with silt. And try to get out some yardage when there's always someone breaking through the ice and falling into the water on a sub-zero day.

To Finish Year Ahead of Contract

Despite conditions like this, The Callanan Road Improvement Company will probably finish a year ahead of time on Contract U. S. 21, New York State Barge Canal Improvement, thanks to careful planning, dogged determination and adequate equipment.

Contract U. S. 21 calls for excavating in the Barge Canal from Lock 16 at Mindenville to Station 4093-78 at Rocky Rift Dam, Herkimer and Montgomery Counties, New York State, for the New York State Department of Public Works, State Office Building, Albany, New York.

The entire job of widening and deepening the Barge Canal is a $27,000,000 project, toward which the Federal Government has been allotting $5,000,000 a year since 1934. This explanation is for the benefit of those who may wonder why Uncle Sam is chipping in for a New York State job. The Barge Canal is the only navigable waterway between the Great Lakes and the Atlantic Seaboard which is entirely within the boundaries of the United States. Hence, it has a considerable potential military value, and the money for its improvement is included in the War Department Non-Military Appropriation Bill.

Contract Prices

The Callanan Road Improvement Company, South Bethlehem, New York, was awarded the contract in June, 1938, on its basic bid of $219,000. The bid quantities were 514,000 cubic yards of earth excavation at 19c per cubic yard, (with boulders over a cubic yard in volume to be paid for at the rate of $3.00 per cubic yard) and 86,000 cubic yards of ledge rock excavation (any rock requiring continuous drilling to excavate) through shale, slate and limestone at $1.42 per cubic yard. Spoil areas were provided by the State of New York and the leveling off of spoil piles was included in the bid prices.

The contractor was allowed 549 calendar days to complete the contract, after receipt of notice to proceed with the work, and agreed to pay a penalty of $200 per day for each day beyond the stipulated

● **Mid-winter scene during the revision of the New York Barge Canal showing the dragline at work near a lock.**

● Top: General drilling operations were carried on despite ice, snow, and frigid temperatures. Center: Working in 2 to 3 feet of water, this Link-Belt shovel is widening the canal. Bottom: The Bucyrus-Monighan dragline removes overburden from ledge rock along canal bottom.

completion date. Yes, you guessed it—there is no bonus for earlier completion. If there was The Callanan Road Improvement Company would collect about $70,000 because the job will be done nearly a year ahead of time.

Work was actually started July 19, 1938, and weather conditions were ideal. In fact, they continued ideal until February, 1939. Inasmuch as the usual length of the navigation season for the Barge Canal is about nine months, from April to December, the first excavating was through the water. The canal remained open for boats until freezing weather.

Four Sections of Operation

The 4.2 miles of deepening and widening were divided into four sections—Section 1 and Section 4 required excavation through earth, interspersed with boulders ranging up to 10 cubic yards in volume; Section 2 involved the removal of one to two feet of earth overburden plus the blasting and removal of one to three feet of rock sides and bottom; Section 3 needed the removal of earth overburden and the blasting and removal of rock bottom.

Naturally, while the canal was open for navigation, Sections 1 and 4 were the obvious ones in which to start work. The original depth of the canal was nominally 12 feet, although in many places the bottom had silted up so that there was only 10 feet of water. The original width across the bottom in earth sections varied from 75 feet to 95 feet, with a side slope angle of 1 on 2.

The new depth was to be 14 feet minimum (with payment provided for extra depth to a total of 15 feet) and the new width was to be 120 feet across the bottom. The side slope angles were to remain the same.

The Callanan Road Improvement Company could have waited

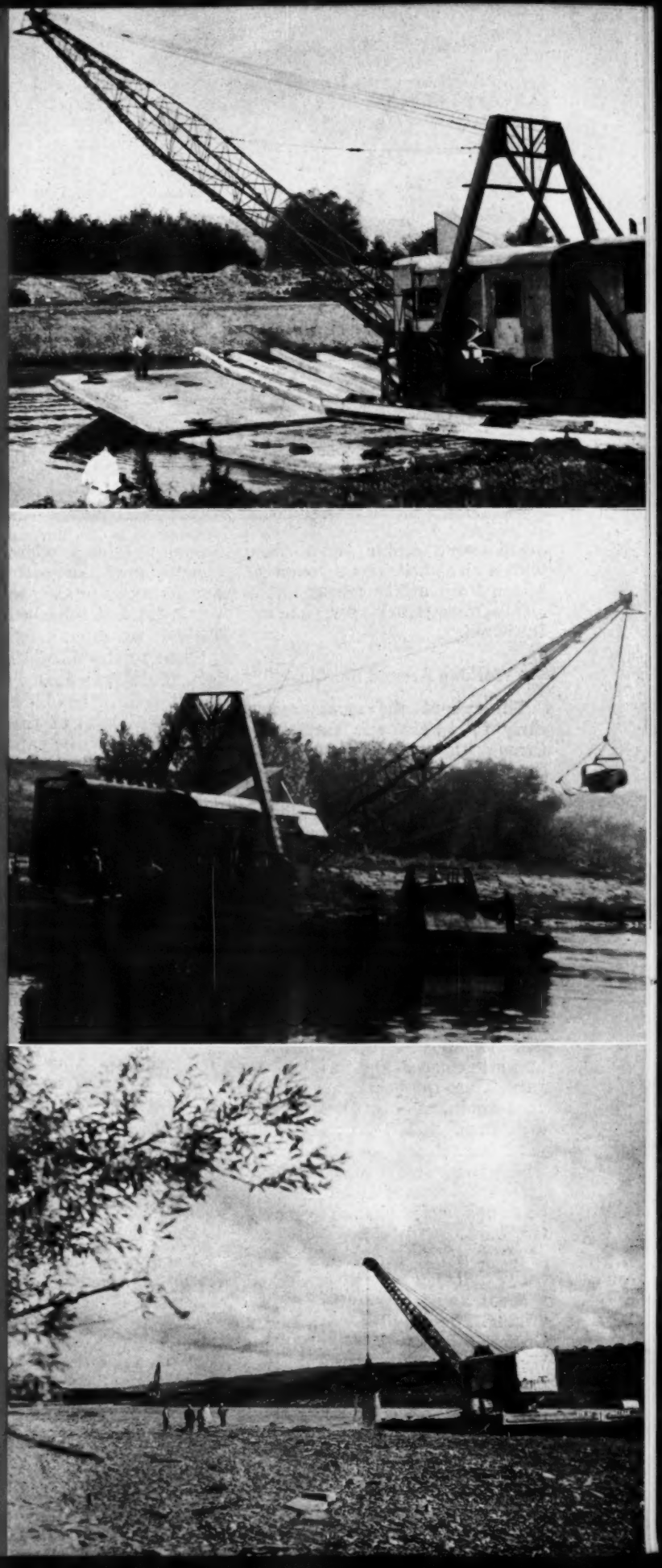
until winter when the canal was dewatered and then put in a few shovels to handle this earth excavation, but that would have meant delay in starting and a tremendous amount of rehandling of material during the progress of the work. A dragline excavator, however, could operate right in the water so that work could be started immediately. And not only could the bucket, operating from the end of the long boom, span the canal in one operation, but also any rehandling of material could be eliminated.

Putting the 5-W to Work

So a Bucyrus-Monighan Model 5-W dragline, powered with a 250 H.P. Fairbanks-Morse Diesel motor, and equipped with a 4-yard rock bucket, was bought and assembled on the canal bank. A 125-foot boom was first installed and used on the earth and boulder removal. It was quickly discovered that the dragline was the answer to this particular problem for underwater work and the elimination of the rehandling materials.

Although no speed or quantity records were established with the Bucyrus-Monighan on this job, due to the numerous boulders and also to the extreme accuracy with which cuts had to be made, it was not unusual to excavate and dispose of 35,000 cubic yards of earth and boulders in a week. The biggest week's work was 38,000 cubic yards of underwater earth excavation.

Included in the contract was the clearing of brush from about 15 acres of spoil area, which the contractor accomplished by hand. The spoil banks were levelled with two Baker bulldozers, mounted on two Allis-Chalmers tractors, one an LO semi-Diesel, and the other a K gasoline powered machine. The only other automotive equipment on the job, aside from the Bucyrus - Monighan dragline, a



● Top: A tense moment as the Bucyrus-Monighan walking dragline mounts two scows to be floated across the canal. Center: Accompanied by a bulldozer, the dragline makes the trip safely. Bottom: A Northwest crane swings a 1-yard clamshell as it trims off under water high spots.

● Orville Z. Van Alstyne, (left) superintendent of the job and Ralph G. Champagne, engineer and assistant superintendent with his dog "Zeke."

small shovel and a small crane with a clamshell, was a couple of ¾-ton Ford utility trucks and a small tank truck for hauling Diesel oil.

"Working Around the Clock"

Throughout the summer and early fall, work was carried on through three 8-hour shifts daily. Since the canal is open 24 hours daily during navigation season (it is provided with buoys and lights to mark the channel for night navigation), there was a certain amount of interruption of the excavating due to the passage of vessels. But these interruptions were neither so frequent nor prolonged as to be serious delays.

The original 125-foot boom on the Bucyrus - Monighan dragline was shortened by the contractor's men to 85 feet, and a 6-yard bucket replaced the original 4-yard. Then the boom was lengthened again, also by the contractor's men, to 107 feet and a 5-yard bucket was attached with which the last of the large-scale excavating was completed. Each boom and bucket change took only two days.

All through the summer and early fall the work proceeded without any important problems arising. The dragline, with Leroy Griffin, Henry Reed, William Wright and George Kipp operating, and Walter Couch, Charles Valente, William Morrison and Joseph Buckley as oilers, operated steadily until the earth and boulder excavation and spoil banks were finished, checked and accepted.

Then in the middle of December, 1938, the canal was "dewatered" and the trouble began. The theoretical level of the water in this stretch of the canal is 322.5 feet above sea level, and the contractor was working to a bottom depth datum of 308.5. But a "dewatered" canal still has plenty of water in it—entirely too much!

Orville Z. Van Alstyne, the contractor's superintendent, and Ralph G. Champagne, the contractor's engineer and assistant superintendent, found anywhere from six inches to two feet of water covering the silted bottom from which they had to remove the mucky overburden and blast out the rock. The time had arrived when they had to become hydraulic engineers and drain out that water, or hire a crew of excavators, drillers and blasters who had had previous experience as clam-diggers.

Sump Pit Dug

A sump pit 5 feet deep was dug in the canal bottom just back of the mitre sill at the lower lock. Drainage ditches were "scratched" through the muck to the sump and the water was drained off through a 12-inch siphon over the sill wall. Since there is always water running into and through a "dewatered" canal, this siphon was a big help—until the water began to freeze — and you just can't siphon ice!

Cleaning Up Silt and Muck

But let's forget the ice for a while — although the Callanan men never will—and get back to the "dewatered" canal while the water is still able to flow. The Bucyrus-Monighan dragline did a noble job of scraping off the muck and silt from the bottom and sides of Section 2 and 4 wherever there was spoil area provided. And so well was the work planned by the Federal and State engineers that the total volume of overburden, as well as rock, that had to be rehandled was only 20,000 cubic yards.

A 1½-yard Link Belt, Diesel powered shovel and a Northwest shovel were used where there was no spoil area on which the dragline could drop its load. Incidentally, as the weather grew colder the excavated material was ice and snow almost as much as it was rock and earth.

Seven Linn tractor dump wagons, with 7-yard steel bodies and Goodyear pneumatic 36" x 8" tires on the front wheels, were put on the job for the month during which the Link Belt shovel was operating, and hauled the rock, earth, ice and snow to a spoil area an average of 1,500 feet away.

Sand Bag Dam Used

Sand bag dams were constructed to keep water out of the ledge rock sections which were to be drilled and blasted, after the overburden was removed. The ledge rock revealed itself to vary from shale to hard limestone, and in the limestone Mr. Champagne found a fossil that looked something like the rear end and tail of a prehistoric lizard. Interested fossil experts please note that this was found "in situ." That's a dollar-and-twenty-five cent expres-

sion meaning "in the same place where the lizard passed out."

Five Ingersoll-Rand X30 wagon drills were wheeled out onto the rocky canal bottom and started to hammer 2½ inch detachable bits down into the shale and limestone. The blast holes averaged 6 feet in depth and the speed of drilling was 23½ feet per hour, gross time, or 34 feet per hour, net time, through the soft rock. Through the hard rock the drilling speed was 11 feet per hour, gross time, and 16 feet per hour, net time.

The shale weighed 3,800 lbs. per cubic yard in the solid and about 2,300 lbs. per cubic yard in the loose. The harder limestone weighed 4,500 lbs. per cubic yard in the solid and about 2,700 lbs. per cubic yard in the loose. The only trouble was to get them in the loose—and not for the purpose of weighing them, either!

The detachable drill bits were re-sharpened after they had drilled six to eight holes in the soft rock, or one hole in the hard rock. The re-sharpening was done at The Callanan Road Improvement Company's plant at South Bethlehem, New York. After three re-sharpenings a detachable bit was discarded.

Self-Contained Drilling Unit Conceived

Keith Callanan, Vice President of the contracting company conceived a somewhat novel idea in connection with the blast hole drilling. He had two Ingersoll-Rand X30 wagon drills mounted on the back of a Linn tractor dump wagon, and an Ingersoll-Rand air compressor mounted on the chassis. The entire assembly was housed in and provided an economical and comparatively comfortable self-contained drilling unit that was peculiarly effective for cold-weather work.

Two Ingersoll-Rand and one Sullivan 315 cfm gasoline-powered air compressors, working at 100 lbs. pressure, were set up on the canal bank to provide air for the blast hole drilling.

One of the standard questions used in preparing such an article as this for this publication is whether the drilling was wet or dry. In this case, the drilling was just about as wet as drilling could be.

Blast holes were spaced an average of 8 feet apart, and were loaded with 10 to 12 sticks of DuPont Gelatine per hole. In the soft rock 1½" x 8" sticks of 30% gelatine were used, but in the hard rock the contractor lowered eight sticks of 40% and four sticks of 60% gelatine.

No. 6 DuPont blasting caps were inserted in the bottom sticks of gelatine; the holes were stemmed with sand and wired up in series. Then a 100-hole DuPont blasting battery had its handles shoved down to start the rock moving.

No jackhammers were used on the job, as the large boulders encountered in the earth sections were all handled by the bucket of the Bucyrus-Monighan dragline, while the blasting in the rock sections shattered the ledge rock so completely that no pot shooting was needed to enable the dragline or shovel to move it.

Dragline Handled 12,000 Yards Per Week

In the rock sections, where there were spoil areas available (which included the greater portion), the Bucyrus-Monighan dragline excavated and disposed of about 12,000 cubic yards of blasted ledge rock per week.

The explosives, of which about four carloads were used, were stored, according to Mr. Van Alstyne, the superintendent, "Wherever Harry Jewell would let us." That is, in a portable magazine in a nearby field.

Harry Jewell is Senior Engineer in charge of this particular excavating contract for the New York State Department of Public Works. He has been connected with the Barge Canal ever since he was graduated from college.

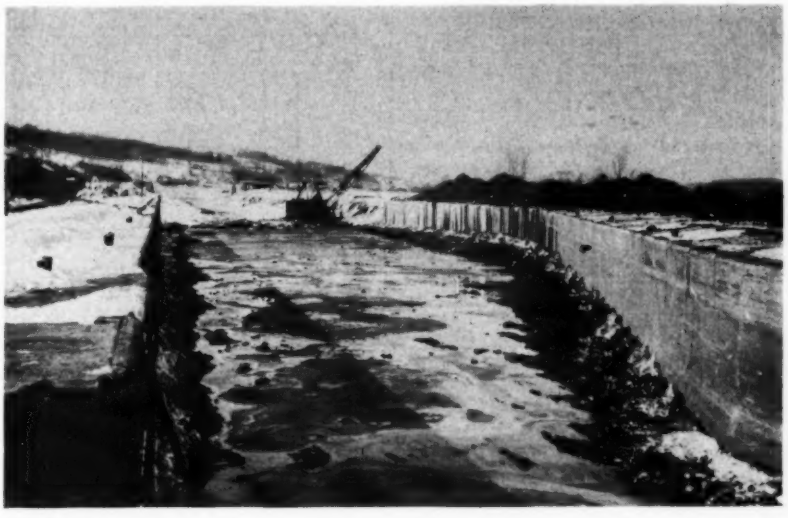
The foregoing description of drilling and blasting may read as though the job were fairly simple—and so it might have been, except for the elements.

In March an ice gorge formed in the river below the lock and the water level in the river raised 18 feet, 4 feet over the mitre sills of the locks flooding the entire 4.2 miles of the contract with 4 feet of water.

Blast Hole Difficulties

There were also several times during sudden thaws when the water in the "dewatered" canal rose faster than the sand bag dams could be raised or the pumps handle the overflow. And each time an acre or more of blast holes was flooded. Even when the holes had been plugged, they silted up so that re-drilling was necessary. The silted-up holes could not be re-drilled or reamed out because

(Continued on page 535)



● **Cleaning up operations between lock walls called for delicate handling of this dragline.**

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A Monthly Publication
Devoted to the Excavating Industry

The Excavating Engineer Publishing Co.
South Milwaukee, Wisconsin

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A Balanced Road Program

Much has been said and written about America's highway program. It has long been a political football for aspiring politicians who find the road program good campaign material to be promptly set aside or, worse, hastily conceived and undertaken upon election to office.

Among those who are honestly striving to better America's road system there is much harmful dissension, one group holding forth for transcontinental toll superhighways, the other group fighting for a more extensive "farm to market" secondary road system.

Neither one of these plans offer an exclusive solution to the highway problem. America's roads, to successfully serve the people, must follow a balanced program based on actual traffic needs of the immediate highway locality. The superhighway group and the supporters of the secondary road plan need but to combine their goals to assure a model highway system for the United States. To be sure, this combination calls for an ambitious and complex program but the result, once achieved, will do much towards building a greater United States.

Study of a recent special survey conducted by the U. S. Bureau of Public Roads for Congress has led to their recommendation of "A Master Plan" of free highway development that is well balanced in all respects. The "Master Plan" directs attention toward the elimination of traffic pressures in urban areas and the coordination of activity in building primary roads.

Because of traffic congestion in and around cities, the Bureau recommends the construction of limited access expressways through cities, supplemented by circumferential belt-line roads.

To meet the requirements of national defense in time of war and the needs of a growing peacetime traffic of longer range, the Bureau urges the planning of primary roads in acordance with a tentatively defined system of direct inter-regional highways suggested in the report. Considerable mileage of new and more direct highways for use by through traffic is proposed in place of existing indirect roads. This suggested system would embody some 27,000 miles of road, almost twice the mileage of the proposed transcontinental toll superhighways.

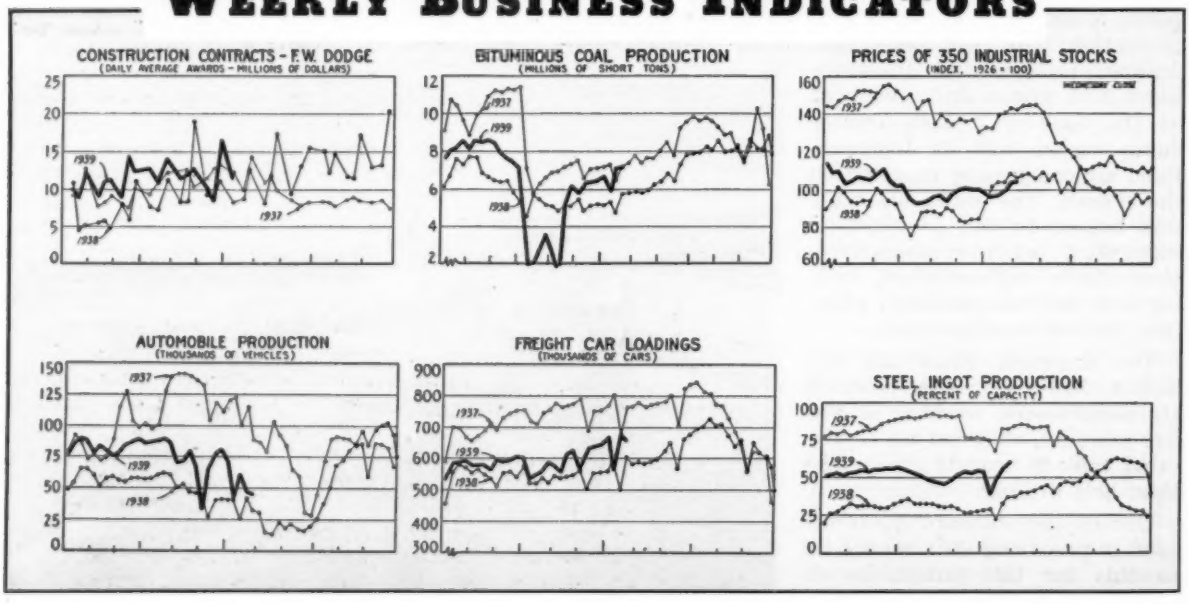
The establishment of a Federal Land Authority is proposed to facilitate acquisition of rights-of-way. The Authority would acquire such rights-of-way at the request of state highway departments and then lease the property to the state over a period of fifty years on terms that would amortize the initial cost of the property during that period. By granting the Authority the power of "excess acquisition," the Bureau expects that the ultimate cost of actual highway construction would be reduced because increased land values would accrue to government as unearned increments.

The "Master Plan" in its entirety is a most ambitious highway program. Logically it must be viewed as an ideal and must be tempered with practical reality.

Before the suggested program satisfactorily can be appraised, its probable cost must be determined. The problem of financing these expressways and highways must be studied to ascertain whether sufficient funds would be available. Heed must be given to the Bureau's own warning that the average motorist has an income of only $1,500 per year.

Adequate consideration must be devoted to the desirability and possibility of financing the proposed program on a "pay-as-you-go" basis. Throughout the country past experience with ambi-

WEEKLY BUSINESS INDICATORS



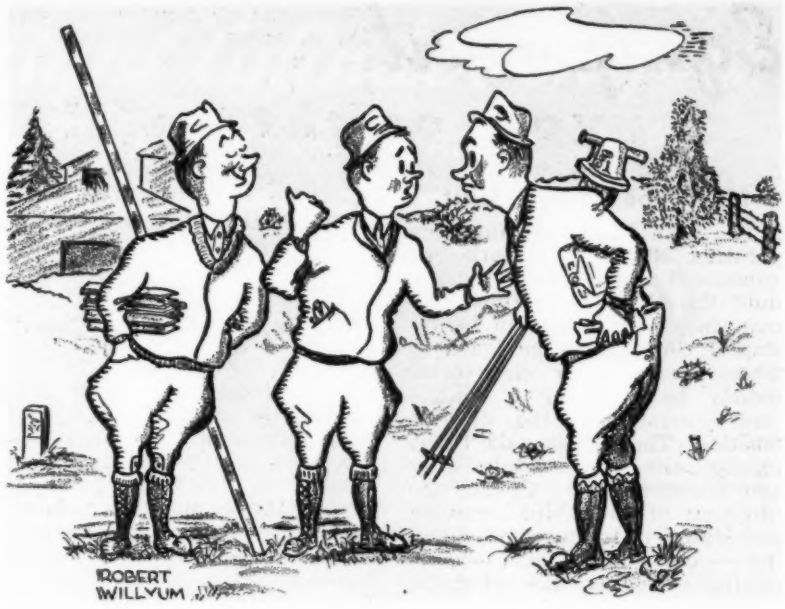
tious schemes for the improvement of highways financed by long term borrowing often has been most unfortunate. Many times highways have been worn out before the obligations incurred have been retired. In other instances so much of the revenue from sources of taxation available for highways has been pledged for bond retirement that insufficient funds have remained for current upkeep and maintenance.

Obviously, the low incomes of most motorists establish a rigid limit to the burden of taxation which they may be expected to assume as their share of the cost of this program. It is now believed by many that this rigid limit of taxation already has been reached.

In several states funds from special imposts on highway users are being used to finance functions in no way related to highway construction and maintenance. It is interesting to observe that the four states with traffic densities causing the most serious congestion are those which are the worst diversion offenders. Massachusetts, New Jersey, New York, and Pennsylvania accounted for more than one-half of the $161,413,000 diverted in 1937. The elimination of the misuse of these special revenues would provide additional funds for use on future highway programs.

Roads are easily America's best investment for relief funds as no other works has such a wide spread influence on the welfare of the people. The dollars spent on highway construction and maintenance do much to stabilize the contracting industry which in turn is the best customer of America's heavy industries and gives employment to many thousands both directly and indirectly. The industries fulfill their place in the cycle by creating further employment thus stabilizing the prosperity of our nation.

Plans for rebuilding and improving our highway system to meet future highway user demands should be incorporated into the regular highway programs of the various states, rather than added as extra facilities. They must be predicated upon the findings of the highway surveys now being made in the various states and fitted to regular budgetary limitations.



"He thinks a nice 'S' curve about here will break the monotony for the motorists!"

General Business Conditions

The month of July has borne out the promise of better business conditions contained in the reports for June. The action of the stock market in breaking out of the rut on the up side, with greatly increased volume of trading, has been a cheering development, regarded by many as confirming the view that the Spring recession had run its course, and that business is once more moving ahead. It is recognized, of course, that the hazards are still very great, and few business men are venturing to set their sights very far ahead; nevertheless, feeling is undoubtedly better, and this in itself is a change of importance in the general business trend.

For the rise of security prices, ample explanation may be found in the better-than-seasonal performance of leading business indices during the past two months. it is true that the trend in June had pointed to an absence of the usual Summer slump, but apparently some skepticism remained until the recovery after the July 4th holiday was definitely established. The steel industry, of course, has been the outstanding example of counter-seasonal improvement, mill operations rising in the latter part of July above 60 per cent of capacity, the highest since last November. However, a quickening of business has been noted in other lines as well, including not only consumption goods, but also non-ferrous metals, electrical equipment, machinery and chemicals. With the figures for June largely complete, the Federal Reserve Board's index of industrial output rose 5 points in that month to 97, and from all indications will be as high, if not somewhat higher, in July.

With July the month when buyers come into the central markets from all over the country to place their preliminary orders for the Fall retailing season, the response to Summer wholesale shows is always followed with interest; and here, too, the results have been encouraging. Indications have pointed to liberal covering of early Fall needs, though evidently buyers are remaining conservative as to the later months of the year. Inasmuch, as retail inventories, from all reports, are lower, both actually and relative to sales, than a year ago, there should be further replenishment of stocks as the season progresses, assuming, of course, no unexpected drop in retail sales. This replenishment of stocks should afford continuing support to the consumer goods industries.

Equipment

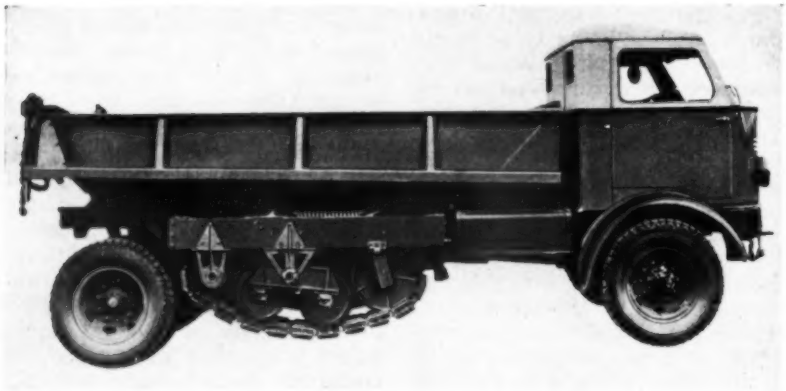
you ought to KNOW ABOUT

New Type Haulage Unit

The Linn Manufacturing Corporation, Morris, New York, has announced a new type of haulage unit, the Model C-5, which, the manufacturer states, can be instantly converted from track to wheel operation, or vice versa, merely by throwing a control lever mounted at the driver's position. The C-5 is said to be ideally suited for road building and maintenance — all haulage problems of townships, counties and states, including snow plowing — oil field haulage — coal mining — logging, and other industrial haulage needs.

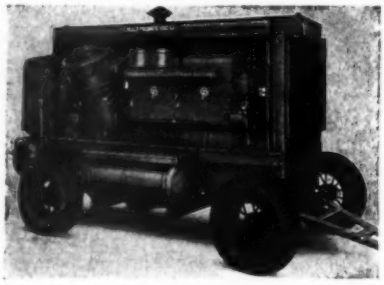
When the C-5 is operating on dual pneumatic-tired wheels, the drive is on the front wheels; the traction unit idling, and merely revolving so as to pass easily over any obstruction. When track operation is desired, the operator pushes the control lever and the rear wheels are raised hydraulically. The wheels can be raised to allow nine inches of road clearance, or they can be allowed to trail or float behind the traction unit.

It is claimed that the C-5 will handle many types of hauling jobs which at present require auxiliary equipment or rehandling of the load. In hauling from pits, for example, the C-5 will come up out of the pit unaided with its own load, and on its own tracks at 12 m.p.h.; and when it reaches good road, it can roll away at 35 m.p.h. on rubber. In addition, it will do those jobs requiring steady track operation, or others requiring only wheel operation. If hauling is to be over good roads for any protracted period, the entire traction unit is readily removed and stored.



700 Cu. Ft. Portable Compressor

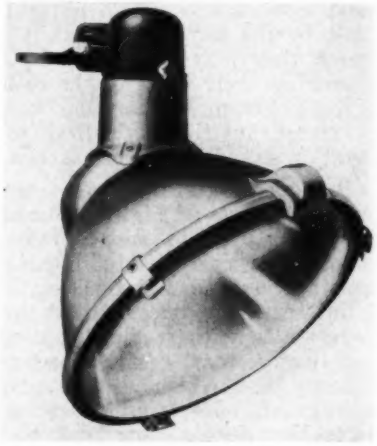
The Chicago Pneumatic Tool Company of Chicago, Illinois, recently announced their Class WO-2 portable compressor. Having a capacity of 700 cubic feet per minute, the manufacturer claims the compressor meets the demand for a compact, efficient Diesel-driven portable unit much larger than heretofore available. As



compared with a large number of smaller units, it offers greater fuel economy, lower attendance cost, lower maintenance expense and requires less space, according to the manufacturer.

New Floodlight Unit

For floodlighting construction projects, industrial yards and other similar places, a new floodlight is announced by the Westinghouse Electric and Manufacturing Company. It can use 750-, 1000- or 1500-watt lamps. Maximum light output is assured by use of vertical-burning lamps, and easily cleaned Alzak-processed aluminum reflectors. A



wide range of beam spreads is possible.

"Hardweld 50"

Announcement of the production of a medium high carbon electrode "Hardweld 50" has been released by the Lincoln Electric Company of Cleveland, Ohio.

"Hardweld 50" is a medium carbon steel electrode designed for the building up of steel parts and surfaces. It is best used on surfaces such as shafts, axles, collars, flanges and tractor parts which require more resistance to deformation, and wear than low carbon steel but must still be machineable.

Readymix Receiving Bucket

Insley Manufacturing Corporation, Indianapolis, announce a new Readymix Receiving Bucket which is designed to be used on any concrete placement job having hoisting equipment. The Readymix Receiving Bucket, it is claimed, lies flat on the ground and is low enough so the entire batch of truck mixer can be discharged into it. Upon being picked up with the bail, the bucket rights itself so as to discharge through a radial gate at the bottom of the bucket. The narrow discharge

"Your New Eight Cylinder Engine is a dandy" REPORTS HOWARD E. MARKS

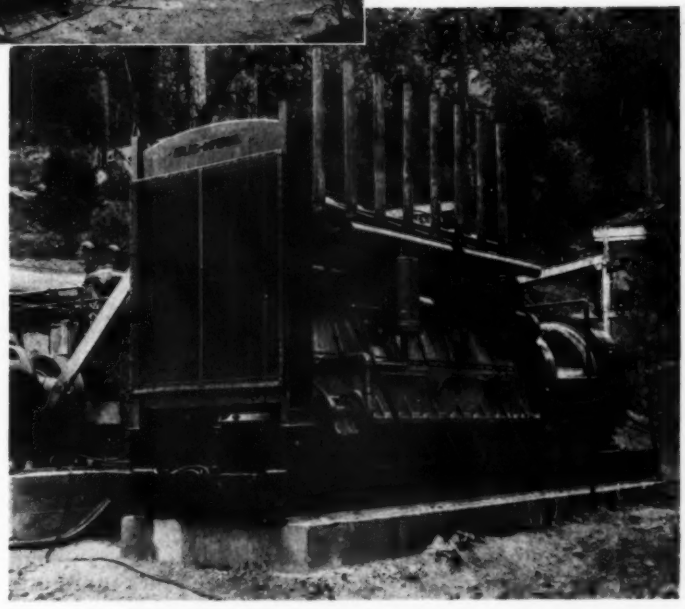
Left, three Atlas Diesels which operate the rock crushing plant of Frank B. Marks & Sons of Newman, California.

Having had years of experience with a pair of Atlas Diesels whose performance they considered outstanding, it was only natural that Frank B. Marks & Sons of Newman, California, should turn to Atlas when a large resurfacing contract necessitated an increase of power.

The contract was for a 12 mile stretch between the Wawona tunnel and the south entrance of Yosemite National Park, requiring 33,000 tons of base rock and 15,000 tons of hot plant mix. The material being crushed is hard blue granite. They have already produced over 40,000 tons without a moment's loss due to engine trouble.

Commenting on their new 8 cylinder Atlas which drives a 175 KW generator, Howard E. Marks says: "That new 8 cylinder engine is a dandy. Everyone in the country stops to see it perform. When we are crushing for base material we run the entire plant (outside of the first primary crusher) with the 8 cylinder engine. There are 290½ H.P. in electric motors hooked up to it and it never stutters"—and speaking of one of his 4 cylinder Atlas Diesels he says: "It is an ideal engine for the primary crusher, as it can get down and lug when the crusher gets jammed with some of this hard blue granite."

Those are the opinions of a road contractor who appreciates the high torque characteristics of Atlas Diesels—one of the features that has held them in high esteem by contractors the world over. Atlas Diesels of the enclosed type are fully illustrated and described in our Bulletin No. 112. Write for a copy today.



Above, the new 8 cylinder, 9" x 10½", 275 H.P. Atlas Diesel, direct connected to a 175 KW, Allis-Chalmers generator.

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ATLAS Imperial DIESEL ENGINES

For your convenience in writing to Atlas Imperial Diesel Engine Co., you will find a card bound in this issue.

gate makes it particularly effective in pouring columns or exterior walls. Once hoisted, the Readymix Receiving Bucket is moved anywhere and concrete can be placed to the exact spot.

New Portable Floodlight

A 250-watt enclosed portable floodlight, for temporary or emergency illumination, has been announced by the General Electric Company. Easily handled with its weight of only 20 pounds, the new light is equipped with a galvanized steel trunnion bracket with a 12-inch circular base, 10 feet of rubber-jacketed cord with plug, and a carrying handle. A polished alzak-processed aluminum reflector is inserted in a cast aluminum housing with the glass door available in plain, lightly stippled, heavily stippled and spreadlight types.

Thirty-Two Horsepower Motor Grader

A 32-horsepower motor grader, the No. 212, weighing approximately 10,500 pounds and available with either Diesel or gasoline engine, has been announced by Caterpillar Tractor Company, Peoria, Illinois. The new machine is especially well suited for cities, townships, special road districts, counties and other political subdivisions. Its overall width is 6'8", and a 10' blade makes it ideal for use on narrow roads where traffic would find it difficult to pass a wider machine, according to the manufacturer.

Every blade position possible with the larger No. 12 and No. 112 models can be equally well obtained on the No. 212. It is thus possible to cut ditches and slope banks, widen and regrade roads from bank to bank, scarify and reshape pitted surfaces on gravel roads or city streets, maintain road surfaces, mix and spread light oil mat.

Flexible Rubber Pipe Joints

One of the latest research developments of the B. F. Goodrich Company is the flexlock rubber pipe joint which allows flexing and bending while remaining leakproof.

According to the Goodrich research engineers who developed the new type joint, it makes it possible for pipe to be laid with a minimum of precaution or worry as to the destructive effects which expansion, contraction or soil stresses might have on it.

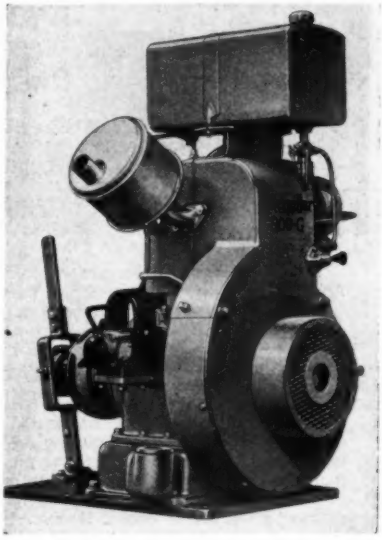
Compact Dump Trucks

The new model E F U cab-over-engine Mack truck typifies the modern efficient unit for fast and reliable service in the contracting field, according to Mack Trucks, Inc., Long Island City, New York.

Seven of these trucks were recently commissioned by the Good Roads Engineering and Contracting Company of Wantagh, Long Island. These units are equipped with 2-batch bodies, each batch being made up of 4200 pounds of cement, sand and stone. With their compact cab-over-engine design, it is claimed these new trucks are easy to handle on narrow streets and in crowded traffic.

"Caterpillar" 5.5 Horsepower Engine

Designed for service with a minimum of attention, the single-cylinder, 5.5 horsepower "Caterpillar" 800-B unit is especially well suited for pumping jobs

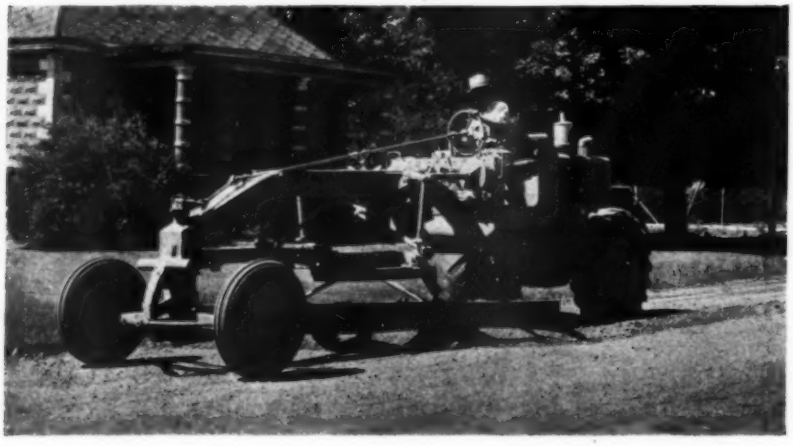


where horsepower requirements are low. With no water to freeze or boil away, and with an unusually large lubricating oil sump, the new engine can run for long periods of time without attention, it is claimed.

Two Speed Ford Axles

Designed for a wider range of operating requirements, the 157-inch and 134-inch wheelbase Ford V-8 trucks are offered with this special axle. The new Ford two-speed rear axle has virtually the same basic features of design as the conventional Ford truck axle. The pinion shaft is straddle-mounted with two large tampered roller bearings in front of the pinion and a straight roller bearing directly behind it. The differential case is supported on large tapered roller bearings.

One notable feature is that in the reduction only four additional moving parts are in operation. A simple planetary system of gearing is used to obtain the reduction.



A ONE-MACHINE ROAD BUILDER

● Holding down building and maintenance cost on temporary mine and quarry roads is second in importance only to assurance that the jobs will be properly and quickly done . . . regardless of weather conditions.

The "99" Motor Grader is helping mine operators meet both requirements. Its ability to handle a variety of jobs that ordinarily require several machines holds down the investment in road building equipment. Its four wheel drive and four wheel steer provide traction and maneuverability not approached by conventional equipment.

The "99" will handle bulldozing, scarifying, disc harrowing and rolling with the same efficiency it shows on grading, ditching, backsloping, etc. And its ability to turn in an amazingly short radius, shift blade under load, eliminate blade side thrust and front-end skidding saves time and money on every operation.

Write for full facts about this one machine road builder and its impressive record operating under the conditions you face. The Austin-Western Road Machinery Co., Aurora, Illinois.

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5-Yard Tractor-Scraper
6-Yard Tractor-Scraper
8-Yard Tractor-Scraper
12-Yard Hydraulic Scraper

For your convenience in writing to The Austin-Western Road Machinery Co., you will find a card bound in this issue.

Field NOTES

Cement Transportation Problem Solved By Big Sacks

Big sacks, of the type shown in the illustration, make it possible to haul bulk cement on the same truck beds used for transporting the ordinary sized sacks. They are being used for the first time on the Mono Basin Tunnel, which is being constructed by the Los Angeles Bureau of Water Works and Supply, and were developed and patented by the Monolith Portland Cement Company, of Los Angeles.

Delivery of cement to jobs using the bulk variety necessitates the use of tank trucks, and because there are comparatively few bulk users, this equipment either stands idle part of the time, or else the truck beds have to be changed to flats for the sacked product. By the use of the large bags, flat bed trucks and trailers can be used for either variety with a great saving in time and equipment.

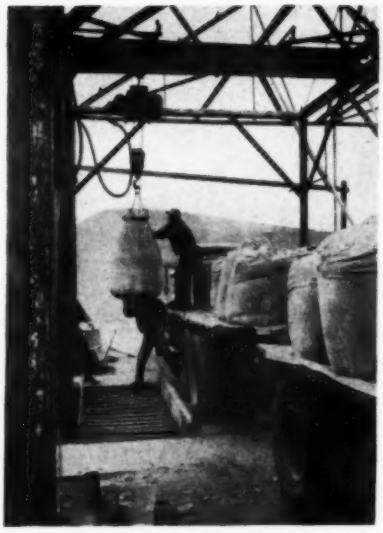
Since bulk cement is from 8 to 10c per barrel cheaper than sacked, a considerable saving may be made by its use, and as the large bags can be delivered to any point of construction, the consequent elimination of special storage and transportation equipment on the job makes bulk use feasible on construction projects where such equipment is not provided.

The bags consist of a tube of heavy canvas about three feet in diameter, with a capacity of 1,600 pounds. The top is gathered around an iron ring to which smaller rings are attached for lifting. On the Mono Basin job an air hoist is used to lift the bags from the trucks, swinging them over a hopper by means of a hook which engages the small rings. The bottom of the bag is closed with a rope, so fastened that a quick pull unties it and permits the contents to fall into the hopper.

Since the bags may be used over and over again, their use is practical from an economic standpoint. During transportation they are covered with canvas, so that a compact-appearing load results.

Michael Treshow and Carleton T. West, engineers with the Monolith Company designed and developed the new containers.

—John R. Marcy



● **Unloading the 1,600 pound bags of cement into a hopper by means of an air hoist on the Mono Basin Tunnel construction project.**

A Wire Stretching Jack

On a big water main construction job in Denver the Lock Joint Pipe company used the simple jack shown here for stretching wire netting inside the big steel cylinder of the concrete pipes, for reinforcing the inside wall. It consists of a section of pipe, with a crooked fork at one end and a metal washer welded over the other end. Inside this washer is a rod, threaded at the end for two nuts, which hold a second fork in place, for gripping the netting. A coiled spring about the end of the rod provides tension when the forks are placed on the netting—*Jos. C. Coyle.*

● **This handy pipe jack is easily made and is a convenient tool for handling wire netting on cement reinforcing work.**

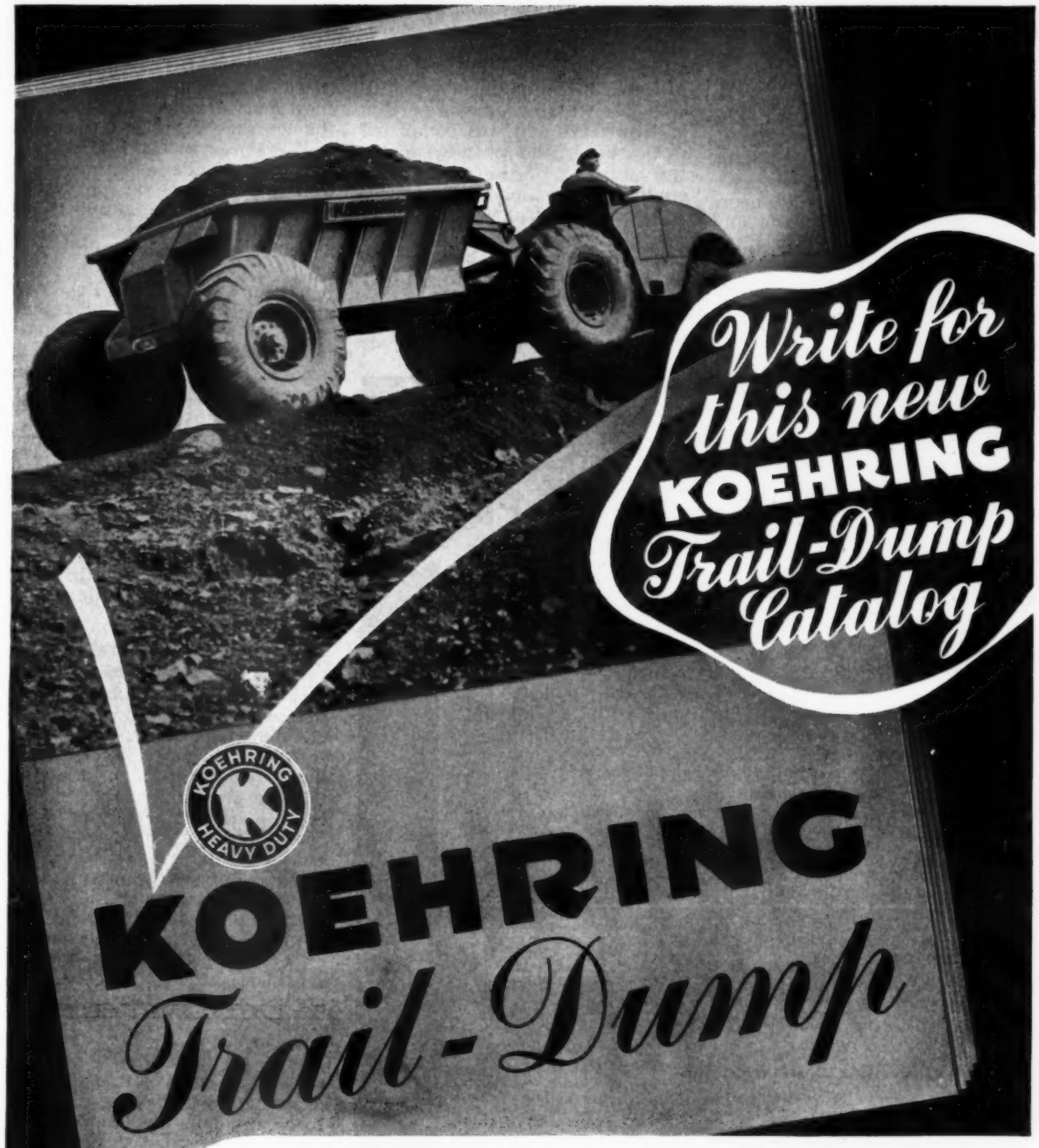
Liability of Ditch Contractor for Slope Erosions

By Leslie Childs

In the letting of municipal earthworks contracts, the question of liability for erosions, or slide-ins, arising after completion but before acceptance is one of importance. And especially so where the work is extensive, perhaps requiring months to perform, and naturally entailing risk from the elements in this respect.

Of course, the contract will be controlling. If the contractor is bound to tender a perfect job, he will be held liable for all defects arising before acceptance. On the other hand, where the contract is silent on this, and merely requires that the work be performed in accordance with the plans and specifications, the rule may be otherwise.

Here the contractor may not be held liable for defects arising after completion but before acceptance, where he has followed the plans and specifications. A nice point for municipal officers to have in mind when letting contracts of this character. And, as an illustration of judicial reasoning thereon, Friederick v. Red-



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wood County, 153 Minn. 450, is squarely in order.

County Lets Contract for Ditch

In this case, the plaintiffs, a firm of contractors, agreed to construct a county ditch on a yardage basis. The work was to be performed according to the plans and specifications prepared by the county engineer who supervised the work. The plans and specifications called for a ditch about 7½ miles in length, from 8 to 10 feet wide at the bottom, and at places 14 feet in depth. The slopes on the sides were to be one to one.

The plaintiffs entered upon the work and performed in accordance with the plans and specifications, and were paid from time to time on the engineer's certificate. The work occupied a portion of two years and was completed in October of the second year. On the 30th day of this month, the engineer issued plaintiffs a final certificate which showed a balance due of $6,761.17.

The county board, however, on December 2nd refused to approve the certificate unless plaintiffs removed a large amount of silt that had washed in on the upper part of the ditch. This, it appears, had been caused by heavy rains that had fallen after the work had been completed. The plaintiffs refused to do this work, claiming they had already complied with the contract terms, and filed suit.

There was no claim that these erosions or slide-ins were caused by any negligence on the part of the plaintiffs. It was simply a case of earthworks having suffered damage by the elements after its completion according to contract but before acceptance by the final authorities. On the above state of facts, the trial court took the position that plaintiffs were bound to remove the earth and silt from the ditch before tendering it for acceptance.

In line with this theory, the court submitted the case to a jury. And following the court's charge, the jury returned a verdict for the defendant, county. From judgment on this, the plaintiffs appealed and the higher court in stating the general rule in situations of this kind, among other things, said:

General Rule Stated

"Where a contractor makes an absolute and unqualified contract to construct a building or perform a given undertaking, it is the general, and perhaps universal, rule that he assumes the risks attending the performance of the contract, and must repair and make good any injury or defect which occurs or develops before the completed work has been delivered to the other party. But where he makes a contract to perform a given undertaking in accordance with prescribed plans and specifications, this rule does not apply.

"Under such a contract he is not permitted to vary from the prescribed plans and specifications even if he deems them improper and insufficient; and therefore cannot be held to guarantee that work performed as required by them will be free from defects, or withstand the action of the elements, or accomplish the purpose intended.

"Where the contract specifies what he is to do and the manner and method of doing it, and he does the work specified in the manner specified, his engagement is fulfilled and he remains liable only for defects resulting from improper workmanship or other fault on his part, unless there be a provision in the contract imposing some other or further obligation.

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NOT in the Contract

Shovel runner Ike came into money suddenly and decided to see the sights. He and a lady friend obtained tickets for the open air opera in the St. Louis Municipal Gardens.

After the play got to going along well into the first act, Ike was conscious of an urge. As it became more insistent, he excused himself and hurried down the aisle. Encountering an usher, Ike asked directions to the men's room.

"Straight forward, the first turn to the left and first door to the right," was the whispered instruction.

Our hero hastened, found the door locked, but an open door ahead beckoned. Trees and shrubbery were plentiful and not a soul was in sight.

Returning to his seat Ike asked his lady friend if the first act was over.

"You ought to know. You were in it," was her reply.

Proprietor of mountain hotel (to newly arrived guest). This is your room, sir. If you want a fine view over the mountains, put a dime in the slot and the shutters open for five minutes.

Mistress—"You say your baby's name is Opium? What an odd name. You know opium is a product of the wild poppy, don't you?"

Mandy—"Yassum, an' if dey evah wuz a chile had a wild poppy, she's got one."

A letter was sent to a rich manufacturer, demanding $50,000 or otherwise his wife would be kidnaped. Through an error, the letter was delivered to a poor laborer of the same name. He replied: "I ain't got no money, but I'm interested in your proposition."

Engineers are often baffled by the fact that some of the girls with streamlined figures offer the most resistance.

She has—
An ermine coat
A foreign car
A Persian rug
A built-in bar
A ten-room flat
And I'll tell you, sir
She does it all on thirty per
And five years back
Some teaching hick
Flunked this gal
In 'rithmetic.

A motorist had just crashed into a telegraph pole. Wire, pole and everything came down around his ears. They found him unconscious in the wreckage, but as they were untangling him he reached out feebly, fingered the wires, and murmered:

"Thank heaven, I lived clean, they've given me a harp."

Dot—So Old Gotrock's check bounced back, eh?

Dolly—Yeah, it was marked "insufficient fun."

Contractor: "Isn't it time you were entertaining the prospect of matrimony?"

Daughter: "Not quite, dad. He won't be here until eight o'clock."

A backwoods mountaineer found a mirror which a tourist had lost.

"Well, if it ain't my old dad," he said as he looked in the mirror. "I never knowed he had his pitcher took."

He took it home. That night while he slept, his wife found the mirror.

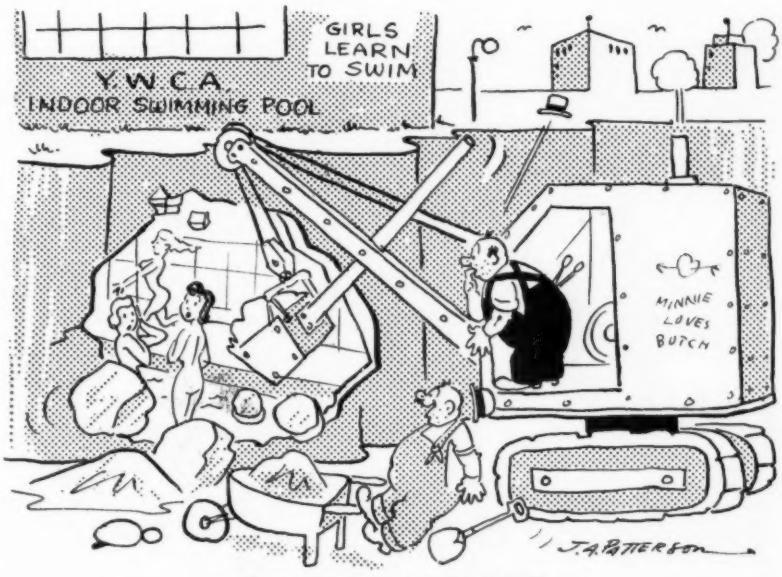
"Hum-um," she said, looking into it, "so that's the old hag he's been chasin'."

Dr. Elston (inquiring after the boy who had swallowed a half dollar): "How is the boy today?"

Anxious Mother: "No change yet."

And says the colored gentleman, "Jedge, Ah pleads guilty an' waives the hearin'." "What do you mean—waive the hearing?" he was asked. "Well," he replied, "Ah jes' doan wanna heah no moah about it, tha's all."

A wealthy, elderly bachelor advertised for a wife to share his estate in return for bearing him an heir. Four years passed and the villagers decided the woman had misrepresented herself. When questioned she replied, "the old man is indeed heir-minded; but he is far from being heir-conditioned."



"Gosh! I must have gone too far!"

Shots from the FIRING LINE

Pennsylvania Turnpike Notes

Of the seventeen contractors who bid for the job of excavating the deepest cut on the Pennsylvania Turnpike at Clear Ridge, near Everett, Bedford County, N. R. Corbisello, of Binghamton, New York, was awarded the contract on his low bid of $882,710.48. Other bids ranged from $929,569.26 to $1,429,932.10.

The cut (Section 13E) will be 150 feet deep, 380 feet wide at the top of slopes and 2,600 feet long, requiring excavation of more than 1,115,000 cubic yards of earth and rock. The Commission once thought it might have to tunnel the mountain, but decided it would be cheaper to make a cut instead.

Under original plans a new tunnel 1,423 feet long would have been bored, making eight tunnels on the PWA-RFC financed super-highway which will stretch a distance of 160 miles between Harrisburgh and Pittsburgh.

Contractors are now completing six of the seven tunnels which were half-finished by the original South Penn Railroad builders more than 50 years ago and are drilling a new tunnel through Allegheny Mountain in Somerset and Bedford Counties.

The last major grading and drainage job, a 7.13-mile stretch in Harrison, Napier and Bedford Townships, Bedford County, went to Herman Holmes, Crystal Falls, Michigan, at a low bid of $1,513,504.98. (Section 12-A.)

Another grading and drainage job, covering .33 miles in Taylor Township, Fulton County, went to Holt, McConnel and Osbourn of Cannonsburg, Pennsylvania, at a price of $52,222.74. (Section 15-B.)

The apparent low bidder for the last grading and drainage contract to be let on the Turnpike was L. M. Hutchison, of Mount Union, Pennsylvania, who asked $487,420.19. Fourteen other bids ranged from $489,517.75 to $711,626.88.

● Athey wagons pulled by RD-8 Caterpillars haul shale for a 200,000 yard fill on the Empire Construction Company's part of the $60,000,000 Pennsylvania Turnpike.

● Drilling and digging operations on the West Portal of the Sideling Hill Tunnel one of the seven tunnels on the "all weather" Pennsylvania Turnpike. Arundel Corporation holds the P.W.A. contract for this tunnel.

The job (Section 14-A) also includes construction of seven bridges and an interchange in East Providence Township, Bedford County. A plate girder structure will connect Route 126, which runs south from the Lincoln Highway at Breezewood, with the Turnpike. Hutchison was also awarded the Turnpike's first grading and drainage contract which is now completed.

Chairman Walter A. Jones has announced a sixty days' extension to June 29, 1940, of the deadline for completion of the Turnpike.

The extension was granted by PWA to enable the Commission to suspend paving operations in the winter months, when freezing and thawing conditions affect concrete pouring and settlement of new fills, until next spring. Meanwhile, during the present construction season, the Commission will continue advertising for bids for paving additional sections that have completely settled and anticipates completing a total of approximately 50 miles of pavement this year.

With all of the tunnel, grading and drainage contracts let construction of the Turnpike is proceeding at a record-breaking pace with some of the contractors working three 8-hour shifts daily.

The sixty day extension of the Turnpike completion date will enable the contractors to pour their concrete in

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There's no getting around it: The road to low hauling-costs isn't a road . . . *but a pair of tracks!*—the tracks of a "Caterpillar" Diesel Tractor. See your "Caterpillar" dealer today, or write direct for more information.

CATERPILLAR TRACTOR CO., PEORIA, ILL

CATERPILLAR

REG. U.S. PAT. OFF.

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● Ben Crowe, East Chicago, Illinois contractor, supervises the finishing touches of his Bucyrus-Erie 10-B clamshell on a highway refreshment stand excavation near Valparaiso, Indiana.

the summer months thus avoiding the dangers of premature disintegration often accompanying concrete construction in the winter. Equally important, through the postponement they will also avoid the dangers of settlement on heavy fills which might throw concrete slabs out of vertical alignment. Commission officials estimate that through the action of rain, frost and thawing during the winter and spring, the fills will settle to a firm, unyielding foundation for the concrete. Use of the subgrade by contractors moving heavy equipment during the winter months also will be another factor in compacting the fills.

During the winter the Commission will continue concentrating on heavy grading and drainage work, which prepares the roadbed for laying of surface. At the same time producers of sand, crushed stone and gravel will have an opportunity to store huge supplies of these materials which will be required by the contractors in paving operations. Thus, with the arrival of spring, the way will be cleared for the Commission to rush paving of the remaining 110 miles of the route.

Revise California Highway Budget

Revision of the 1939-41 California state highway budget affected only slightly the $28,000,000 total previously set aside by the Highway Commission for major road construction in the next biennium, representing largely "give and take" exchange, with the appropriations for some projects slashed and the difference applied to others.

The budget previously approved earmarked $18,200,000 for highway maintenance — $2,000,000 more than the amount for the current biennium. Emergency storm repairs and lessened Federal aid were cited as the reasons for the increase.

An anticipated $80,200,000 is expected to be derived from highway revenue sources, including the gasoline tax, motor vehicle fees, fuel tax and Federal grants during the next two years, Public Works Director Frank W. Clark announced in approving the budget. He anticipated cities would share $16,000,000 of the 1939-1941 gas tax collections and that from all the sources the State would draw about $42,400,000 for highway purposes.

In the new budget, 30 revised or new items appear among 200 odd proposed projects approved earlier in the year. For Southern California, $742,200 was added for seven new highway and road projects. A total of $432,000 was deducted from nine previously approved projects in the southern part of the state, with the appropriation for the Olympic Boulevard widening and straightening project being increased from $800,000 to $950,000. This leaves 21 projects budgeted with a total of $3,752,200 for highway work in Los Angeles county for the two-year period.

Highway Officials to Meet in Virginia

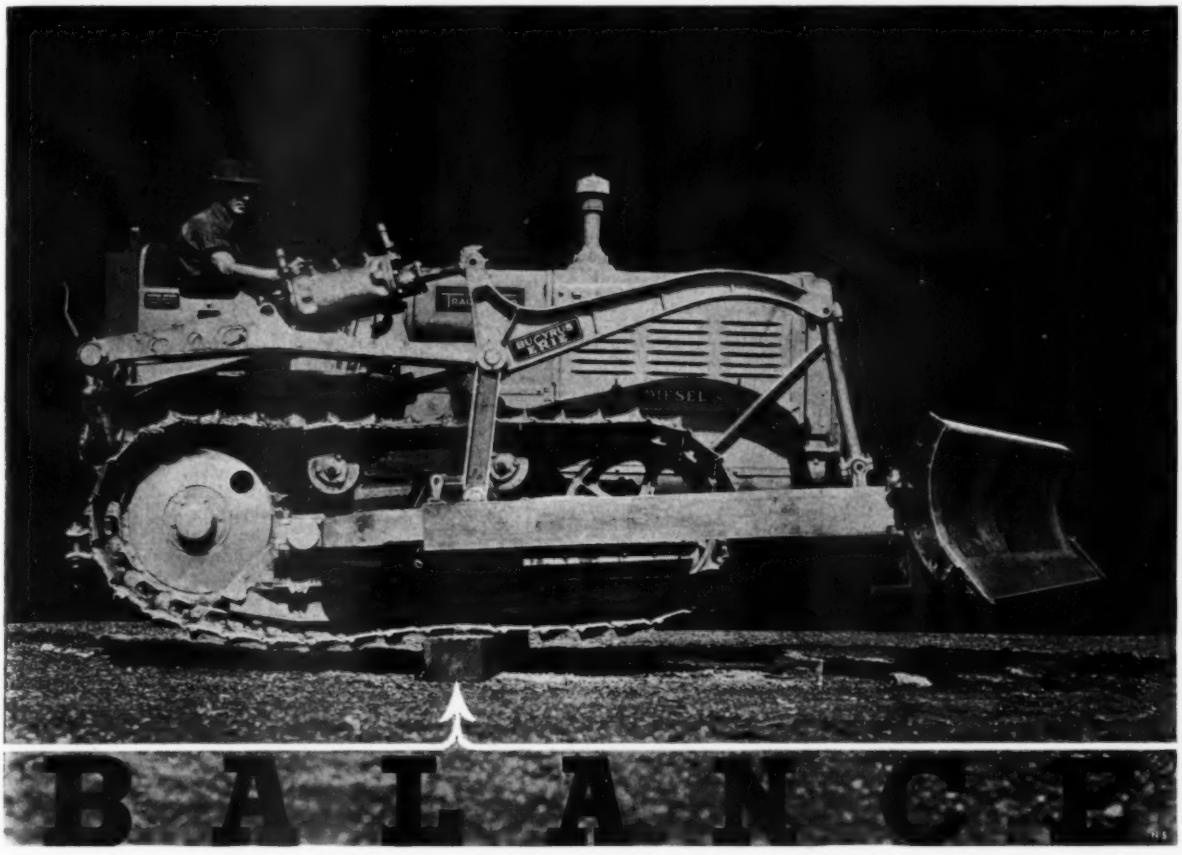
From October 9 to 13 the American Association of State Highway Officials will hold, in Virginia, its twenty-fifth anniversary meeting. The meeting will open with a breakfast in Washington and a tour of Virginia highways which will take in the Skyline Drive and a portion of the Blue Ridge Parkway. The business sessions will be held in Richmond, and the meeting will be concluded with a trip to Williamsburg, Jamestown, and Yorktown. Some 800 highway officials and engineers, from all parts of the country are expected to be in attendance.

Inlet Structure Construction Under Way at Fort Peck

Government forces have started preliminary work at the inlet structure of the diversion tunnels at Fort Peck Dam in accordance with a plan which requires placing of additional concrete at the front wall, or head wall, and increasing the height of the structure by ten feet. The completed structure will have a solid head wall, and water from the reservoir will pass downward through gable trash racks between the head wall and back wall in order to enter the tunnels.

A land crane, equipped with a clamshell bucket and mounted on a 30' x 100' work barge, was moved into position in the forebay upstream from the head wall and started the first cut for the south coffer-dam excavation which was completed last month.

Vertical trash racks along the front wall of the inlet structure are being removed and converted into stop logs by covering the openings with steel plates. The trash racks are handled by a tractor crane, equipped with a "grappler," which operates along the top of the back wall of the inlet structure. The converted trash racks will be used to close several of the vertical openings in the head wall, forcing the water from



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Bucyrus-Erie Bullgraders and Bulldozers are the only hydraulic blade equipment units offering BALANCED tractor and blade combinations. Addition of this equipment to your tractor will not materially change the tractor's center of balance. With its balance maintained, the tractor will keep its crawlers FULL LENGTH on the ground and apply full tractive effort to the blade.

Maintaining center of balance also reduces tractor wear and tear . . . by relieving overloads on idlers, on track rollers, and on other parts of the tractor affected by nose-heavy units.

Get in touch with your nearest International Harvester TracTrac-Tor Dealer; he'll give you additional facts on all the features which are offered by Bucyrus-Erie tractor equipment.

Bucyrus·Erie

SOUTH MILWAUKEE, WISCONSIN

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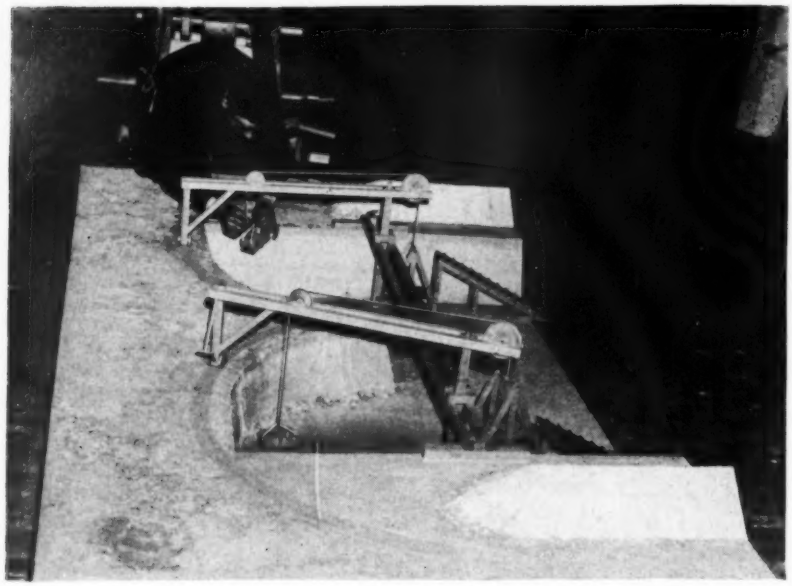


● Constructed from the original mechanical drawing of Leonardo Da Vinci, famous Italian artist, this working model shows the forerunner of the modern power shovel. Weights were put on the platform at the right, pulling up the wooden bucket loaded with material. Upon reaching the desired height men on horses pulled the wooden boom supported by wooden wheels in a half circle to the right and dumped the material as shown. As can be seen in the illustration this excavator worked as a dual unit.

the reservoir to flow through the remaining openings at a velocity which will allow it to carry away earth and other material upstream from the head wall, greatly assisting the excavation work at this location.

Work in connection with building of the plant required for the new construction was started immediately upon approval of the general scheme for unwatering the site of the structure. To date, the following buildings have been erected: Offices for government construction forces and inspectors, tool room, warehouse, foremen's change house, mechanic's change house and repair shop. The work of reconditioning and moving a concrete plant formerly located at the outlet portals of the diversion tunnels has been started. Subgrading of roads has been completed. Work of floodlighting the area and subgrading for railroad tracks is under way.

"A Digging S. O. B."

Under the above salty title the August issue of Fortune, top American luxury magazine, tells the story of Bucyrus-Erie in a most interesting fashion.

Fortune deftly introduces the article by stating:

"When you hear about South America's need for U. S. capital goods, when you read of great public-works projects at home, whenever you learn that the surface of the earth is to be further adapted to the uses of mankind, then you may be nearly certain that the products of Bucyrus-Erie figure in the essential calculations. Here is the story of machines that do the work of thousands of men, but work that thousands of men would seldom, if ever, be called upon to do."

Strikingly illustrated, the article gives a human, down-to-earth picture of a company that is, to quote Fortune, "—the world's No. 1 earth mover."

One of the highlights of the article is Fortune's interesting account of Bucyrus-Erie's largest placer dredge—"a gigantic, $750,000 affair built in 1917 for the Lenskoie gold mining company, somewhere in Siberia. Garbed in an ungainly, barnlike super-structure, she was completed just in time for the revolution, and hung around South Milwaukee until 1926 (part of the hull had got as far as Vladivostok), by which time Lena Goldfields, Ltd., which controlled Lenskoie, was ready to take delivery. Transportation and erection came to $750,000, including the cost of what was doubtless the most extraordinary ride ever given a machine. Though in 1917 she would have been shipped westward, lower eastbound railroad charges in both the U. S. and the U.S.S.R. in 1926 caused her to travel two-thirds of the way around the world. Loaded onto no less than seventy-five flatcars, she traveled from South Milwaukee to Baltimore by rail, then by steamer to Murmansk, that chilly port on the Barents Sea. She was placed on railroad cars again and rolled southward and eastward to Irkutsk, Siberia. There she was met by a small army of tractors, horses, men, women, and former aristocrats, who, first transferring her to sledges and carts and wagons, hustled her over 200 miles of mountain trails to Kachuga, on the Lena River. The parts were loaded onto barges, and the caravan went down the Lena to its junction with the Vitim River. Here they were reloaded to small boats and canoes, turned back and sent up the crooked Vitim, for a total river journey of about a thousand miles. They arrived several weeks later at a spot called Bodaibo, which for all its desolation must have looked like heaven. Bodaibo was just eleven miles from the final destination, and the only thing remaining was to complete a narrow-gauge railroad to the spot. This done, the crew fell to work setting up the dredge. A year and a half after she began her remarkable journey she was ready for action, and promptly justified the trouble and expense by excavating pay dirt, delivering a little less than $1 worth of gold per average cubic yard, at the rate of 350,000 cubic yards a month."

Regarding Bucyrus-Erie's present position, Fortune says, "No other competitor anywhere offers so many different kinds of excavators . . ." Making a "fair guess" at the total United States excavating machinery volume in 1938 as $35,000,000, Fortune calls attention to Bucyrus-Erie plus Bucyrus-Monighan total sales as an "impressive third of the grand total." This position the magazine attributes to "limberness and versatility in merchandising and engineering, which can be described as a consistent nonresistance to new ideas."

The history of Bucyrus-Erie is analogous with the history of power digging and Fortune has recorded both of them well in a story that is just as animate as its title—"A Digging S. O. B."

Contract Let on Last Section of Shasta R. R. Relocation

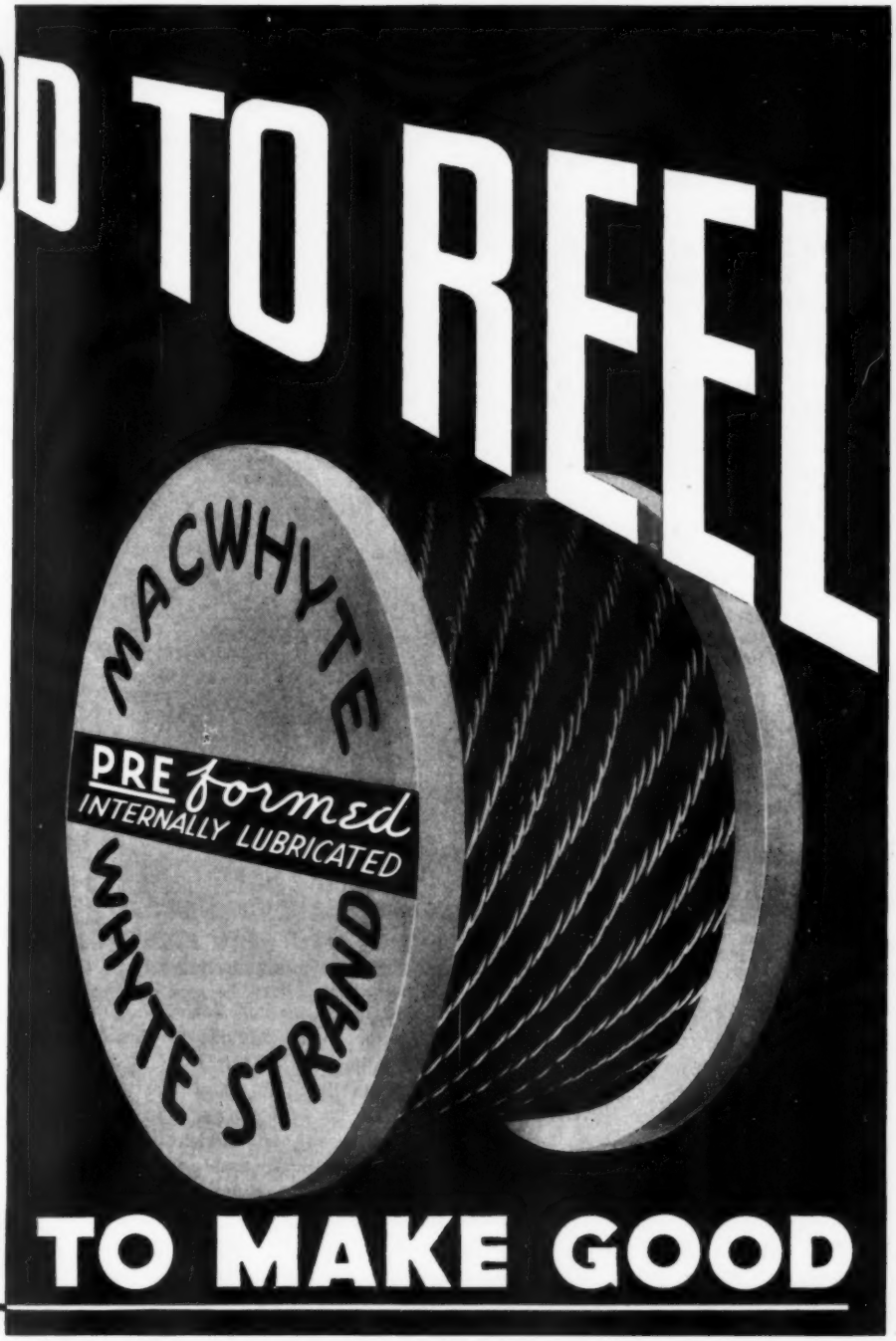
A contract for $1,857,567.50 covering the last five-mile section of the relocated line of the Southern Pacific Railroad around the site of the future Shasta Reservoir, central Valley Project, California, has been awarded to A. Teichert & Son, Inc., United Concrete Pipe Corporation and Ralph A. Bell of Pollock, California, who submitted the lowest of six bids received on the section.

Contracts for railroad relocation totalling more than $7,000,000 have now been awarded covering all of the 30 miles of the roadbed grading, 12 tunnels and 5 bridges on the relocated Shasta route. The Bureau of Reclamation has received bids for two more bridges. The only feature of the relocation yet to be advertised for construction is the huge double-deck Pit River Bridge which will carry both the railroad and U. S. Highway 99 over an arm of the Reservoir. Bids are expected to be called this fall for the last bridge.

The contract for this last five-mile section, near Pollock, California, includes the construction of the remaining 5 tunnels, the north approach for the Pit River Bridge, and several highway crossings in addition to drains, culverts, and other structures.

When completed this new 30-mile line will replace 37 miles of old road between Redding and Delta Station, California, and will have 5,000 degrees

FROM ROD TO REEL



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AND IT'S FIELD PROVED . . . On all kinds of jobs, on all kinds of equipment, under all kinds of conditions, Macwhyte ropes are constantly being proved. All year long, Macwhyte Engineers out on the job are constantly proving, improving, perfecting the *right* wire rope for your specific job.

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less curvature. The new railroad will be open for traffic probably in 1941. Passenger trains connecting California with the Pacific Northwest are expected to save 45 minutes over present schedules.

The contractor is required to finish all the work on this section within 435 days after notice has been received of award of contract.

Award Section of Coachella Branch Canal

The award of a contract for $2,279,-212.31 for the construction of a 47-mile section of the Coachella Branch Canal, All-American Canal System, has been announced by government officials.

Morrison-Knudsen Company, Inc., and M. H. Hasler of Los Angeles, California, submitted the successful bid, which was lowest of eight proposals received and considered by the Bureau of Reclamation.

This 47-mile section will bring 90 miles of the 130-mile canal under construction, work having begun on a 43-mile section about a year ago.

Taking out of the All-American Canal just west of the sand hills in the East Mesa of the Imperial Valley, California, this branch canal threads northwest about 100 miles to a point past the Salton Sea, then curves finger-like and returns south about a third of its distance through the Coachella Valley.

This second section of the canal will begin a little south of the Salton Sea, almost paralleling the sea for about two-thirds of its length, to near Dos Palmas, California.

● **Lunn Brothers of Sharon, Pennsylvania, demonstrate the adaptability of a dragshovel on a small basement excavation job (20'x30'x6') at Farrel, Pennsylvania.**

The contract includes 32 siphons, 4 spillways, and 5 drainage inlets in addition to excavation work. These structures are necessary because more than 160 washes cross the Canal line. These washes are dry ordinarily, but at times of heavy rain or cloudbursts, they carry floods of short duration, heavily loaded with sand and silt. It is estimated that about 90 structures will be needed to cross the washes, even though some of the washes will be grouped together by means of diversion channels and levees.

The siphons covered by this contract will have rectangular-shaped barrels.

Approximately 1,000,000 acres of rich desert lands in the Imperial and Coachella Valleys ultimately will be irrigated by the All-American Canal and this Coachella Branch Canal.

The 80-Mile All-American Canal is virtually completed and probably will be put in use the early part of next year. About 500,000 acres now irrigated in the Imperial Valley will be served by this canal.

The Coachella branch is designed to serve more than 350,000 acres of arid lands, which have not heretofore been irrigated. These lands lie in the section known as the East Mesa of the Imperial Valley between Holtville, California and Yuma, Arizona, and in the southern end of the Coachella Valley north of Salton Sea. Some lands in the Coachella Valley are at present being supplied water by pumping from wells.

The All-American Canal system was authorized as a part of the Boulder Canyon project in 1928.

Los Angeles County's Master Plan

The second of three official steps leading to a realization of a master plan for highway construction in Los Angeles County, which has been contemplated for 16 years, was taken at a public hearing before the Los Angeles County Regional Planning Commission in the California State Building, Los Angeles, August 4.

The plan provides for the building of some 1,800 miles of highway in the county on terms co-operatively agreed upon by the authorities of the county and 24 of its incorporated cities. California law requires that three public hearings on the proposal be held—two before the planning commission and the final one before the Board of County Supervisors, before the last named body can act on an ordinance creating it. The August 4 meeting marked the second held before the planning commission, another having taken place on July 12. The third and final hearing, before the Board of Supervisors, is tentatively

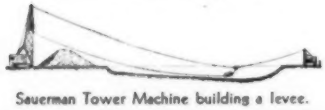
SAUERMAN LONG RANGE MACHINES

DIG, HAUL & DUMP FOR A FEW CENTS PER YARD

Sauerman Slackline Scraper, operated by dragline crane hauls gravel from midstream up to crushing plant.

Sauerman Slackline Cableway digging in river.

Sauerman Drag Scraper digging in hill.



Sauerman Tower Machine building a levee.

The first cost of a Sauerman Cableway, Drag Scraper or Tower machine for the average long haul job is less than the cost of any other equipment that will *dig, haul* and *place* an equal yardage of materials. Moreover, a Sauerman machine is easy to operate and demands little by way of repairs, assuring a minimum daily expense.

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scheduled for late in August.

The planning commission began its study of the master plan shortly after its creation in 1923, with the thought of adopting some measure of highway coordination that would eliminate the former haphazard guesswork. To assure success it was necessary to obtain the co-operation not only of the incorporated and unincorporated cities, but likewise of real estate subdividers and tract developers. The adoption by the State legislature ten years ago of a law authorizing counties to adopt a master plan for highway construction by ordinance, lent impetus to the general movement. William J. Fox, chief engineer of the planning commission, announced at the August 4 conference that the commission had been successful in getting all the political subdivisions in the county united on the proposed master plan, and recommended that the time had now arrived to give the plan significance by the adoption of an ordinance creating it. This, he recommended, should be done to give property owners the knowledge and information where to set their building lines when constructing new homes and business buildings so that at some future time they will not be compelled to raze or move them on the opening of a new highway.

In the San Gabriel Valley, northeast of Los Angeles, 17 cities which had street improvements pending, have decided to make the plans conform to the new master county plan.

California's Main Highway Entries

Authority to construct local service roads paralleling State highways where traffic is so great that there is danger in permitting unrestricted entry upon main routes, has been granted the State Highway Department by the California State Legislature. Entry upon main highways from service roads paralleling them will be prohibited, except at points designated by State authorities. Passage of the act has launched activity in service road construction by counties throughout the central and southern parts of the state, projects contemplated, or already underway, aggregating several millions of dollars in cost.

Government Financed Irrigation Reaches $130,000,000

Contracts totaling more than $130,000,000—for labor, materials and machinery—are in full swing on Bureau of Reclamation self-liquidating irrigation projects, according to government news sources.

Labor contracts in progress August 1 amounted to about $100,000,000 and materials on order such as cement and steel together with machinery such as dam spillway gates and power plant equipment made up the rest.

Under contract are 32 major labor jobs, which call for an expenditure of $93,169,000, chiefly on man power.

Biggest labor jobs are the construction of Shasta Dam and its power plant on California's Central Valley reclamation development and the completion of Grand Coulee Dam on the Columbia Basin irrigation project in Washington.

Shasta Dam will not only be the second highest concrete masonry dam in the world, ranking after Boulder, but it will rank second largest, in cubic yards of concrete masonry, after Grand Coulee. Shasta's spillway will create a waterfall three times higher than Niagara.

The Shasta construction job which was awarded to the Pacific Constructors Company, Inc., Los Angeles, amounts to $35,939,450. It will be finished in 1944.

The completion of Grand Coulee Dam, the base of which was covered under a separate contract, is scheduled for 1942, and will cost $34,442,240. Consolidated Builders, Inc. of Oakland, California has the job.

Shasta and Grand Coulee together also account for a large part of the $30,000,000 of materials and machinery on order, according to the report. Shasta construction calls for 5,800,000 barrels of cement, at a cost of about $6,900,000. In addition four generating units for the power plant have already been ordered which amount to about $4,300,000.

Grand Coulee's completion requires about 3,500,000 barrels of cement, at about $5,200,00 and the Bureau has

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Yes sir—time is money on this job. They're working under a penalty clause. Tough digging slowed them down at the start, but the job is sailing along smoothly enough now, and it looks like they'll beat the deadline.
Just to make sure, I gave the wire rope a once-over today. You can tell it's had some tough treatment, but I'm sure it'll finish the job with plenty to spare. Good thing, though, that they used our Excellay Preformed Rope. Any other rope there would have given them trouble long ago.
Yours, al

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These engineers know what they are talking about, because they spend most of their time right out where the rope is used. They know what punishment it has to stand and how to stretch your wire rope dollar. Besides, they have no axe to grind—they are not interested in promoting any one construction or grade of wire rope over any other. For American Tiger Brand Wire Rope is made in all constructions and all grades.

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already awarded contracts for three generator units in the power plant at a cost of $4,150,000.

The two generator units now on order for Boulder Dam, which will bring the number installed in its power plant to 11, with 6 still to be bought and placed in operation as the demand for electrical energy justifies the installation, will cost $2,375,000.

Deschutes Contracts Awarded

The first contracts for construction work on the Deschutes Federal Reclamation Project in Oregon were awarded last month by Secretary of the Interior, Harold L. Ickes.

A contract which covered the construction of outlet works for Wickiup Dam was awarded to C. J. Montag & Sons of Roseburg, Oregon, on a bid of $154,653.50.

Another contract for the construction of Crane Prairie Dam will be awarded to Vernon Bros. Company of Boise, Idaho, on the Company's bid of $98,560, when a repayment contract which is now pending has been executed with the Central Oregon Irrigation District.

Seven contractors submitted proposals which were received and opened by the Bureau of Reclamation at its Bend, Oregon, office on June 27, 1939.

The Wickiup Dam, about thirty miles southwest of Bend, Oregon, will be constructed on the Deschutes River to store flood waters for the irrigation of 50,000 acres of dry but fertile lands, previously cultivated, immediately north of Madras, on the east side of the river in Central Oregon. Water will be diverted to the project lands through a main canal about 65 miles in length.

● An old fashioned split-rail fence forms a contrasting background as these three modern Ingersoll-Rand Jackhamers work on the Skyline highway route in Virginia. J. L. Vilbig is the contractor.

The Crane Prairie dam site is about 12 miles upstream from the Wickiup Dam.

The outlet works for Wickiup Dam, covered by the one contract, will include a trashrack structure at the inlet, conduits leading from the trashrack structure to the gate chamber and from the gate chamber to the valve house, a gate chamber, and a stilling basin. Construction of the main section of the Wickiup Dam across the river has been postponed until the Crane Prairie Dam has been completed. The contractor must finish the outlet works within 415 days after commencing the job.

The Crane Prairie Dam, covered by the other contract, will replace an old existing dam constructed by the local people which is inadequate. It will be a moistened and rolled embankment of clay, sand and gravel, with a layer of rock rip-rap. The dam will be 35 feet above the river bed and will be 285 feet long. There will be a concrete conduit at the right abutment, provided with a fish screen and control structure at the inlet end and a stilling basin at the outlet end. The flow of water in the conduit will be controlled by two slide gates. The spillway will be an unlined and uncontrolled open channel approximately 750 feet long. The contractor will begin work within 30 days after notice of award of contract has been received and will complete the work within 300 days.

The pending contract between the Bureau of Reclamation and the Central Oregon Irrigation District provides for the repayment of the cost of the Crane Prairie Dam and reservoir at a cost not to exceed $400,000.

The Bureau of Reclamation has also entered into a contract with the Jefferson Water Conservancy District to repay the cost of construction of the Wickiup Dam and reservoir, the North Canal, and a distribution system estimated to be about $8,000,000.

The President approved the Bureau's finding that the Deschutes project was feasible in November, 1937.

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The "Red Devil" Does the Job

(*Continued from page 500*)

projected cut was set far ahead on shore and after three tries, her 85 foot port spud sank into the ground on the center line of the cut. While her four 1150-horsepower Busch-Sulzer Diesels warmed up below, a technician adjusted the $5,000 Sperry gyroscope in the pilot house to the forward range ashore and deckhands joined the floating pipeline to the dredge discharge.

Nick Paulin Starts Her Off

Slouching through the notables who were present, Nick Paulin, chief operator, approached the control board with his shirt tail out, and chewing a plug of tobacco. With all the ease with which he steered his automobile, Nick lowered the ponderous 80-foot cutter ladder halfway to the bottom and pressed a button which converted two-thirds of the power of four Diesels into energy for the main pump. He swung the "New Jersey" to port and to starboard on her down spud and tightened each of the 1¼ inch swing lines on their 40 tons of anchors. Then he lowered the ladder the rest of the way to the harbor floor and started the cutter.

With a shudder that made her tremble from her cutter head to the end of her spuds, the cutter bit into hardpan and boulders and shook her like a wet dog as Nick pulled the "New Jersey" back to the port side of the center line of the cut. The half ton sheave on the cutter ladder groaned under the pull of the swing line and the port swing anchor bit deep into the harbor bottom as Nick swung the head of the dredge in a widening arc across the face of the cut.

In the control room above, the gyroscope indicator swung proportionately. A magic tracer etched in red ink the rate per minute of swing of the dredge and her exact course appeared across a sheet of tracer paper. Far out on the end of the discharge line mud, water and rocks rumbled along and slopped over the breakwater approach into the designated dump area. Nick turned and spoke to the company officials.

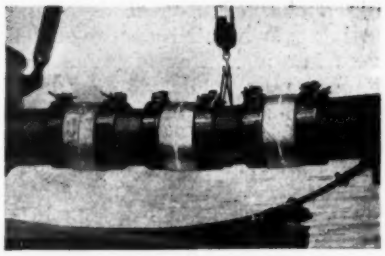
"Gentlemen," he said, "I reckon the red devil can dig 'er up!"

"Dig 'er up" she did. The "New Jersey" did all that Nick predicted, and more, for she had the power it takes to remove that kind of material. Though a dipper dredge was used in the outer harbor to remove some shale and a small amount of the toughest material, the "New Jersey" daily pushed out from 10,000 to 30,000 cubic yards of the hardest material.

Dimensions of "New Jersey"

Try to imagine, if you can, a dredge this large. Her hull length is 245 feet overall. She is 52 feet wide and scraped the locks at Sault Ste. Marie, Michigan, when the tugs brought her through the Soo canal. Her cutter ladder, containing the suction intake and cutter shaft, is 80 feet long. She can

● **The "Red Devil" moves in with lowered cutting shaft for work along the banks near the Upper Entry coast guard station.**



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1. GOODALL "SSS Red Ring" Dredging Sleeves can be built to withstand the highest pressures encountered in this service.

2. The special GOODALL construction of the tube insures exceptional resistance to abrasion.

3. The flexibility of the "SSS Red Ring" Sleeve results in a permanently *tight* joint, regardless of tidal sway.

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In other words, "SSS Red Ring" Sleeves guarantee continuous, trouble-free operation of the pipeline from the dredge, under the most severe conditions. They are available in all sizes from 6" to 36", I. D., built to pass government specifications. Given the service requirements, we will construct sleeves of the proper length, number of plies and thickness of tube. Your inquiries will receive prompt and careful attention.

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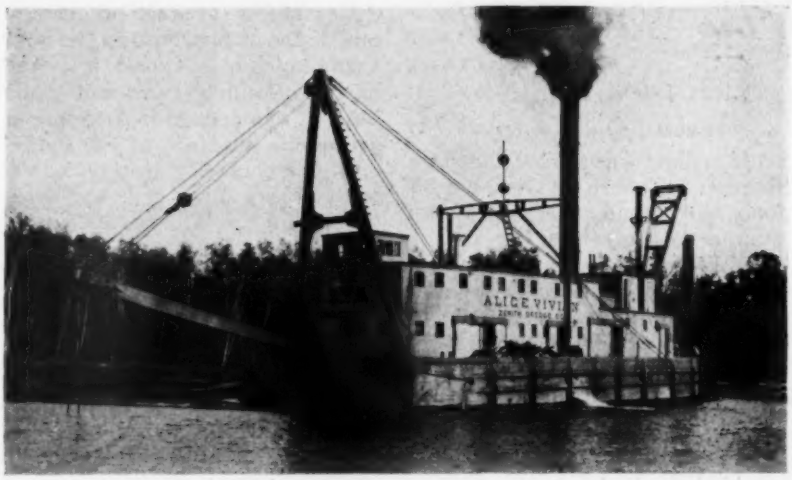
dig a channel 60 feet deep and swing over a cut in excess of 400 feet in width. Her fifty-one inch square rear spuds, 85 feet long, are formed of 2 inch thick steel. 60 tons of anchors were used at times on each swing line to pull the cutter across the face of the cut and to hold the dredge in a strong wind.

On her 13½ inch steel cutter shaft was expended enough electrical energy to break the shaft before the cutter could be stuck. Her hull is 14'3" deep at the sides. She can, and did, pick up boulders 20 inches in diameter, weighing hundreds of pounds, pumped them through her main pump, lifted them 16 feet and shot them at high velocity through 5,000 feet of pipeline.

The main pump in the forward compartment of the engine room was electrically driven at an average speed of 285 revolutions per minute. It was so large that a hydraulic lift was used to operate the service manhole which was opened when the pump became clogged and it was necessary to remove the obstruction. By crouching, a man could walk down through the intake pipe and work near the huge impeller vanes. Stumps and 3 foot boulders were lifted from the pump by a hand crane.



● The "Alice Vivian" made a gallant try on a job that was too big and tough for her size.

Some Trouble Encountered

For all her seeming ease in removing material not usually dredged by hydraulic methods, the "New Jersey" had some trouble. On her large diameter spiral cutter, the abrasive action of the material she encountered wore away 2 inches of the hard steel daily, and short shutdowns were then necessary to sharpen the cutter with an acetylene cutting torch. This was usually done when the swing anchors were being moved or a vessel was passing. Inside her main pump were steel liners an inch in thickness and these wore so that they had to be replaced frequently, sometimes as often as each three weeks.

Her 30-inch pipeline was so heavy when the line was loaded that the pontoons under it could not float freely behind the dredge as they could on smaller dredges. In order to meet the problem of anchoring the pipeline and still permitting the free movement of the dredge, one or two special elbow connections were used, one usually being placed near the stern of the dredge and one wherever it was desired to bend the pipeline toward the dump area. These connections were bent as sharp as a pretzel and a swivel in the middle of the "S" permitted a movement of 270 degrees even though the pontoon holding the affair was securely anchored to the harbor bottom. These turns were also lined with heavy steel. As surprising as it seems, a series of tests conducted by the contractor on these bends proved that only the equivalent of the line friction loss of 100 feet of pipeline was built up in each elbow.

When additional lengths of

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HERE is trailer capacity up to 45,000 lbs. with the ease of loading that comes with light, single purpose trailers—just drop the front, load and jack the bed up and replace the wheels. This feature, combined with other Jahn Trailer advantages, means new speed. There are no ramps to build and the load can be definitely placed without fuss or maneuvering.

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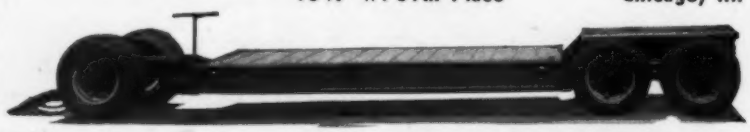

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A tricky fight manager once stuffed a lot of horseshoes into his fighter's gloves. But he overloaded them so the poor pug could barely lift his hands—and was an easy knockout. *Don't handicap your cranes the same way!*

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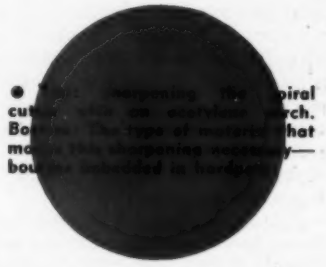
pipeline were needed they were hooked into the line directly astern of the dredge. A quick opening connection was used in the center of the pipeline so the line could be parted with a minimum of lost time when it was necessary to permit lake boats to pass.

Special Cutter for Hard Material

An ordinary 8 or 10 foot spiral cutter was used in excavating much of the material, but in the hardest material a special cutter 8 feet long, studded with steel teeth, was successfully used. With the exception of a part of the bank high above the water line, none of the material showed a tendency to cave during the process of dredging. It was not unusual to see a bank standing vertically 20 feet above the water surface.

In general, a "Y" valve was used on the shore pipe to fill the dump area. The line was divided into two branches near the dump area as the fill progressed. While the dredge pumped on one branch of the line, additional points of pipe were added to the other branch. In one instance the "Y" valve failed to close completely and was left open enough to let sand and fine material ooze through. Two days later a dismayed shore crew found 400 feet of pipeline plugged with sand. The pipe had to be dismantled and dug out by hand.



Accurate maps of the dredging area were furnished, and the daily advance of the dredge was followed by checking three different angles with a mariner's sextant and plotting the course and location on the map with a long armed protractor. The cuts were made as even as if they had been dug by hand. The gyroscope in the control room was responsible for that. So many degrees port; so many starboard, and there she was. But let me quote Nick on that.

He shut off the port swing motor one morning, reached for the starboard swing control and dropped a neat shot in the brass cuspidor at 8 feet. "I'm supposed to run out of bank at 12 degrees on this here thing," he swore, "and when I git there I'll be damned if I don't."

Operated 18 Hours Per Day

The "New Jersey" worked an average effective time of 18 hours per day, 6 hours usually chargeable to handling swing lines or pipeline, waiting for vessels to pass, minor operating repairs and clearing the cutter or pump. She finished what was the largest dredging project ever attempted in the upper entry of the Keweenaw Waterway, where dredging has been done since the 1890's.

The "New Jersey" leaves more than an exceptional record with the U. S. Engineer Office in Duluth. In the main part of the government office lies a massive 800 pound nugget of pure float copper, removed from where it lodged in the cutter 30 feet beneath the cold, blue surface of Lake Superior. Inscribed on the shiny side of the copper nugget are the words: "Copper found in Portage Canal, Dredge 'New Jersey,' May 27, 1937."

They might have written, instead, "A great job, well done." For copper is durable. Words inscribed thereon would live forever; longer than a mere lifetime.

Fast Work on a Hard Job

(*Continued from page 509*)

it was found too difficult from a practical point of view to locate a wagon drill at exactly the proper location and angle over an existing hole. To make matters worse, the flood waters usually froze. Only dogged determination and unlimited patience were responsible for the successful completion of the drilling and blasting of this ledge rock.

An ingenious feature, devised by Mr. Jewell, was a rapid and accurate means of locating high spots in the rock sections. After the excavating was completed, he merely had these sections partially flooded (which, so far as flooding was concerned, was no novelty to the contractor), then he had the water level pumped down to a trifle less than the bottom datum of 308.5 feet above sea level. The few remaining high spots were visible as little islands, which were easily and quickly cut down as soon as discovered. This eliminated all need for a depth survey by instruments and Mr. Jewell was able to accept the job without such an expensive and time-consuming survey.

Floating Dragline Across Canal

Another interesting feature of the job was the floating of the Bucyrus-Monighan dragline from one side of the canal to the other. A single scow large enough to carry the dragline was not available, so Mr. Van Alstyne secured two small scows, each about 75 feet long by 24 feet wide. These small scows were lashed together and then spanned across with 12″ x 12″ timbers. The Bucyrus-Monighan dragline was run down the bank, across a "gangplank" of 12″ x 12″ timbers and up onto the two scows, all under its own power, of course. Then, for good measure, an Allis-Chalmers tractor with a Baker bulldozer draped around it was added to the load.

The gallant captain and crew set sail for the opposite bank and made a safe crossing, although not establishing any speed records for transcanal travel. The dragline and tractor disembarked under their own power across another 12″ x 12″ timber "gangplank" and were operating again just five hours after they started their voyage. Aside from the fact that every one of the 12″ x 12″ timbers was split or broken, there was nothing to mar the pleasure of the trip—and Mr. Van Alstyne was so happy about the outcome that he threw his hat into the canal as a sort of thank offering to the water gods.

Only nine employees were required during the summer and fall months of 1938, and from the late spring of 1939 until the completion of the contract. The Bucyrus-Monighan dragline, disposing of the material it excavated, made other help unnecessary except for levelling spoil banks and a few odd jobs, such as the cutting down of the rare high spots in the earth sections.

Finishing Up Canal Bottom

This final trimming off of high spots under water in earth sec-

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The quality of "HERCULES" (Red Strand) Wire Rope begins with the fixed determination to produce a product that will be *consistently* long lasting . . . dependable . . . economical. It involves the use of acid open-hearth steel wire, correct design and manufacturing methods, long experience — all double-checked by rigid tests and exacting inspections from start to finish. The result is a wire rope that you can rely on—just as thousands of others are doing.

With wire rope, it pays to use the best, for therein is the way to increased safety, longer service and more continuous operation. You take no chance when you specify "HERCULES"—the wire rope that has proved its ability by its service record.

In order to be suitable for all purposes, "HERCULES" (Red Strand) Wire Rope is made in a wide range of both Round Strand and Flattened Strand constructions — all of which are available in either the Standard or Preformed type.

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● Two shovels working in the ice, snow, and slush of the 85-foot wide pilot cut that was later widened to full width.

tions was handled by a Northwest crane with a 40-foot boom and a 1-yard clamshell bucket; the outfit being mounted on a barge and towed from spot to spot. Bert Pritchard and Roy Beattie, as well as one or two of the regular dragline operators handled this work.

From 100 to 200 men were employed on the rock excavation from December through April. Hourly wage rates, set by Federal and State authorities, were as follows: Common labor, 50c; Dragline operators, $1.50; Oilers, 75c; Truck drivers, 55c; Drillers, 75c; Blast hole loaders, 65c; Tractor operators, 55c; Bulldozer operators, 65c; Pump men, 65c; and Compressor operators, 90c.

During the winter months the job ran day and night in three 8-hour shifts, including Sundays from January to April. For night work the canal was brilliantly illuminated by the contractor's own 110-volt lighting plant.

Averaged 104 Yards Per Hour

The average excavating record for the entire job, on a gross time basis, was 104 cubic yards per hour, figuring assorted equipment —dragline, shovel and clamshell.

The safety record of the job was excellent, there having been no serious accidents, aside from the numerous falls through the ice. Mr. Van Alstyne reported that sometimes as many as six men would be crowded around the stove trying to dry themselves after icy baths. What happened to Mr. Van Alstyne's hat when the Bucyrus-Monighan dragline was floated safely across the canal

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Local distributors in principal countries on the following continents: Europe, Africa, Asia (except Japan and China), Australasia and New Zealand.

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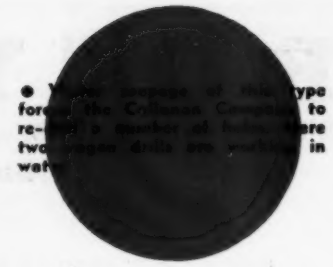

could hardly be classed as an accident.

The contract was under the joint supervision of the United States Engineers, with Howard Eggleston, Surveyman, on the job, and the New York State Department of Public Works of which Frederick Stuart Greene was Superintendent when the contract was signed, but of which Arthur Brandt is now Superintendent. William Robinson was the original Assistant District Engineer for the New York State Department of Public Works, but Robert Cameron was appointed Assistant District Engineer in charge when Mr. Robinson was promoted.

The officials of The Callanan Road Improvement Company are B. R. Babcock, President; J. R. Callanan, Vice President; Ronald Kinnear, Treasurer; and H. E. Battin, Secretary. Keith Callanan, Vice President is in charge of the contracting operations of the company and Orville Z. Van Alstyne was the contractor's superintendent on the job. Ralph G. Champagne was Engineer and Assistant Superintendent. Prescott D. Archibald was bookkeeper.

The Callanan Road Improvement Company, a quarry operating firm established in 1885, has quarries in South Bethlehem, Feura Bush and Kingston, New York. Another noteworthy job recently completed by the contractor was the famous Gorge View Highway east of Little Falls, New York, in which a difficult cut was made through syenite rock, one of the hardest and heaviest known rocks.

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Here Is a Bargain

in used excavating equipment

(taken from page 542)

TRACKSON—CRAWLER WHEELS—Type 4C-W —15 ton. Only used for demonstration. Condition just like new. Attractive price. Located Milwaukee. Box 2387

For other bargains in shovels, draglines, cranes, locomotives, trenchers, and miscellaneous contractors' equipment turn to pages 541 and 542.

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A Money Saving Accessories

Blocks and Linings

Beco Blocks and Linings take the heavy loads at the increased speeds demanded of modern excavating equipment. These Beco products are durable and tough — that's why replacements and adjustments are less frequent.

Rope Sockets

Bulldog wedge rope sockets never fail. The harder the pull . . . the tighter the grip! Attachment is easy and quick and directly in line with pull, eliminating costly kinks. Made in a dozen sizes and four different styles. Write for bulletin.

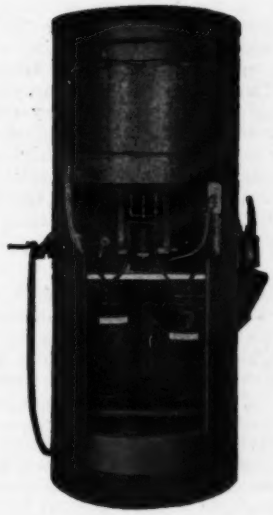
Wire Rope

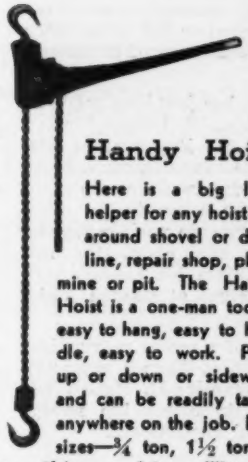
Selected by the men who build your excavating and drilling machinery, Bucyrus-Erie rope has the special features that spell better performance. B-E wire rope has a uniform high quality, and comes in the right sizes, types, and construction for your exact needs. Send for wire rope bulletin.

New Bucyrus Oil Reclaimer

With the NEW Bucyrus Oil Reclaimer, used oil is reclaimed by a simple washing and filtering process at an average cost of about nine cents per gallon. It is a scientific fact, arrived at by leading research engineers and chemists throughout the country, that engine-use breaks down only the weaker and unstable molecules of your oil. These constitute about 10 per cent of the oil—the other 90 per cent, the strongest particles of the original oil, can be separated and cleaned for re-use by the NEW Bucyrus Oil Reclaimer.

Investigate the possibilities of the Bucyrus Oil Reclaimer before you discard another quart of used oil.





Handy Hoist

Here is a big little helper for any hoist job around shovel or dragline, repair shop, plant, mine or pit. The Handy Hoist is a one-man tool—easy to hang, easy to handle, easy to work. Pulls up or down or sidewise, and can be readily taken anywhere on the job. Five sizes—¾ ton, 1½ ton, 3 ton, 4½ ton, and 6 ton. Write for descriptive literature.

Push-Pull Jack

No matter how unusual your "push, pull, clamp, or straightening" problem may be, BECO Jack is the tool that gives you a safe, sure, and proved means of doing the job better. Screw lengths—10", 12", 14", 16" and 18". Capacity 35,000 lbs. Send for bulletin.

Red Arch Chain

New Red Arch incandescent butt-welded dragline chain has twice the strength and wearability of ordinary chain. It will save you extra money because of less shut-down time. You can get any size chain from ⅝" to 1½" to fit your bucket. Write for complete story.

T-27

BUCYRUS-ERIE

EXCAVATING, DRILLING, AND MATERIAL-HANDLING EQUIPMENT . . . SOUTH MILWAUKEE, WISCONSIN

For your convenience in writing to Bucyrus-Erie Co., you will find a card bound in this issue.

Trade notes

The Hercules Powder Company has announced the following appointments: R. W. McKee has been named acting manager of the Birmingham, Alabama, office following the sudden death of J. J. Grimes, manager for the last twenty years; F. George Trescher has been named acting manager of the San Francisco office where he replaces J. B. Johnson, former manager, who was recently transferred to the home office at Wilmington as director of purchases.

Announcement has just been made of the appointment of W. Robert Timken as Assistant to the President of The Timken Roller Bearing Company. Since graduating from Harvard University, in 1933, he has been active in the office and factory, serving in various capacities throughout the plant. He will continue to maintain his headquarters in the general office at Canton, Ohio.

As the result of a recent reorganization of the Stewart-Warner accessory sales division, Maurice G. McCall has been appointed to direct the newly-formed Technical Department.

The Chain Belt Company of Milwaukee announces the appointment of the Construction Machinery & Supply Company, 617 State Street, Toledo, Ohio, as its distributor of Rex construction machinery in the Toledo area. The line handled by the company consists of Rex Pavers, Mixers, Centrifugal Pumps, Plaster and Motor Mixers, Cold Patch Mixers, Diaphragm Pumps and the Pumpcrete.

On July 11, near Toccoa, Georgia, R. G. LeTourneau dedicated a road machinery factory — the LeTourneau Company of Georgia. This new plant is to be used in the manufacture of the large Tournapull.

Coincidental with the recent acquisition of the tractor equipment division of the Continental Roll and Foundry Company of East Chicago, Indiana, by Gar Wood Industries, Inc., the Gar Wood road machinery division has announced the appointments of W. J. Adams, J. E. White, Duke Kerrick, and Gil Koehler, all formerly connected with the tractor equipment division of the Continental Roll and Steel Foundry Company.

Announcement has just been made by the Quaker City Rubber Company, whose main office and factory is located at Philadelphia, Pennsylvania, of a new Branch which they have opened at Houston, Texas. This branch will be in charge of H. M. Sossaman, Branch Manager, and is located at 201 San Jacinto Street, where they will carry a very substantial warehouse stock of belting, hose, packing and miscellaneous rubber goods used in the Southwest. The Houston Branch will serve the states of Arkansas, Louisiana, Mississippi, New Mexico, Oklahoma and Texas.

Along with plans to erect new additional buildings and consolidate all manufacturing facilities at Aurora, Illinois, S. F. Beatty, President of the Austin-Western Road Machinery Company, has just announced the following executive changes: Vice-President F. L. Jerome has been made Assistant to the President; Vice-President H. M. Kleiser has been placed in charge of Sales, Advertising, Service and Research; R. K. Stiles has been made Sales Manager; and A. O. Teckemeyer will become Manager of Governmental Sales Division.

Book reviews

A truck driver's guide which enables him to keep operating costs down and to drive with maximum safety, is offered without charge by Dodge Truck Division of Chrysler Corporation, Detroit, Michigan. The guide covers a variety of key subjects, care and treatment of the truck engine; how to make tires last longer; importance of proper treatment of clutch, brakes and transmission; safety and courtesy on the highway and numerous other topics important to truck driving.

Specifications and mechanical features of the "Caterpillar" Diesel D6 Tractor are discussed in a 32 page booklet, just published. Giving a complete understanding of the Diesel engine that powers the machine, cutaway photographs and explanatory captions are used throughout. Transmission and track construction are similarly handled in separate sections of the book. Copies may be obtained by writing Caterpillar Tractor Company and requesting Form 5403.

Diesel Progress, 2 West 45th Street, New York, announces the publication of Volume Four of the Diesel Engine Catalog. This 316 page book, which will be ready to mail September 1, contains a detailed description of one hundred and seven different Diesel engines. With over 800 illustrations beautifully printed in color, the new book goes into the matter of individual design discussing the features of each machine in a clear cut, thoroughly understandable manner. The publishers have attempted to make it possible for the reader to grasp readily and quickly the difference between various makes and types of engines and to select the one best suited to meet his demands. Copies, at $3.00, can be had from the publishers.

The Associated Equipment Distributors have published a new Roster showing the complete list of their hundreds of members, just what manufacturers they distribute for and just what accounts they represent exclusively, giving the name and address of each distributor and his telephone number. The Roster, selling at $2.00 per copy, can be obtained by writing M. R. Hunter, Chairman, A. E. D. Roster Committee, 327 South 16th Street, Milwaukee, Wis.

Authentic information on the analyses of any size coal from every shipping mine is now available according to an announcement by National Coal Publications, 304 Law Bulletin Building, Pittsburgh, Pennsylvania. The material has been secured from complete copies of all analyses data filed with the National Bituminous Coal Commission by the District Producers Boards. These figures are being published in separate books for each District. Orders or inquiries should be addressed directly to the publishers.

A new folder on Heavy Duty Drifters for mining, tunneling and quarrying has been issued by the Worthington Pump and Machinery Corporation. Copies can be had upon request.

Printing of the Fourth Edition of "Manhattan Rubber Products for Industry," a condensed catalog of hundreds of mechanical rubber products has been completed by The Manhattan Rubber Mfg. Division, 94 Townsend Street, Passaic, New Jersey. Particular emphasis is given belting, hose, packing, molded rubber goods, industrial asbestos friction material, rubber roll coverings, tank linings, and abrasive wheels. Copies are available on request.

R. G. LeTourneau, Inc., has released a new 8 page booklet describing Angledozers and Bulldozers. Copies of this folder which show these units working in a wide variety of material under a variety of conditions may be obtained from the manufacturer.

The Water Hammer Arrester Corporation of Milwaukee has announced the release of a booklet which presents in a clear and concise manner the essential facts regarding the Wacor Water Hammer Arrester—a combination mechancial-pneumatic type of arrestor constructed so that air can neither escape nor be absorbed by the water thereby eliminating destructive water hammer pressure.

The General Electric Company of Schenectady, New York, has announced the following new bulletins of interest to the excavating field: Type B Direct-current Motors; Wound-rotor A-C Crane Motors; Crane and Hoist Motors; Extra-Heavy-Duty D-C Mill Motors; Capacitor-Motors; G-E Motors Pass All Tests; Arc-Welding Electrodes; Arc Welders; Alternating-Current Arc Welders; Di-

rect-Current Arc Welder; Diesel Electric Industrial Locomotives; Portable Cable; and Industrial Cable. Write to General Electric for the copy or copies that interest you.

The Decatur Pump Company announces the release of bulletin 40-60-A and Catalog-Bulletin 115-A. The first deals with Burks Pumps for shallow and deep well water systems while the second covers Burks Super Turbine and Centrifugal Pumps for semi-industrial applications.

A new catalog with forty (on the job) operating illustrations showing what the Patrol Sweeper can do, has just been issued by The Austin-Western Road Machinery Company of Aurora, Illinois. The book deals with costs; discusses working speeds, provides descriptive information and specifications; covers types of service it provides; and explains and illustrates its adaptability for a wide range of uses. The manufacturers will gladly send a copy to any interested person if requested on official stationery.

The mechanical features of "Caterpillar" Diesel Tractors, Engines and Road Machinery, are discussed in a Booklet just issued by Caterpillar Tractor Company. The book, which is profusely illustrated, contains brief sections, each devoted to a separate "Caterpillar" feature, and each showing how this feature has an effect on the working ability and long life of the machine. Copies of the booklet may be obtained by writing Caterpillar Tractor Company, Peoria, Illinois, and requesting Form 5205.

FOR SALE

RATES: 60c per line—minimum charge $2.40. Repeat insertions with no change in copy—three insertions for the price of two. ¶ Display advertising in this section at published display advertising rates. ¶ Estimate 41 characters per line, counting all spaces and punctuation as one character each. Allow ten characters for box number for blind advertisements. If address given, counts same as advertising copy. ¶ Rates are net (no commission, no discount) and payable in advance of publication. Send your remittance with insertion order and copy. ¶ Closing date—15th of preceding month. Example—January issue closes December 15.

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SMALL SHOVELS, CRANES AND DRAGLINES
Up to 2¼ Cubic Yards

BUCYRUS-ERIE GA-2 GAS-AIR HIGH LIFT SHOVEL. Good operating condition. Located Eastern Pennsylvania. Box 2289

BUCYRUS-ERIE 34-B Combination Diesel shovel-dragline, 1½-yd. Used ten months. Overhauled since. Good as new. Located Kansas City, Mo. Box 2317

P&H MODEL 400 GASOLINE SHOVEL. Waukesha engine rebuilt late 1938. Machine generally good condition. Located Arkansas. Box 2285

BAY CITY GAS TRACTOR TYPE SHOVEL AND DRAGLINE—¾-swing. Fair condition. Located Pittsburgh. Box 2286

BUCYRUS-MONIGHAN 2-T Diesel Dragline. 70' boom. Located Kansas. Box 2337

LORAIN-40 Gas Shovel. Electric starter. Waukesha engine. Located North Carolina. Box 2267

BUCYRUS-ERIE 43-B Gas shovel. 28' boom, 17' dipper handle, 1¼-yd. dipper. Chain crowd. Electric starter. Wisconsin 6-cylinder 6"x7" Model E engine. Extensively repaired. Excellent shape. Located vicinity Boston. Box 2257

MEAD-MORRISON gas ⅝ yd. shovel. Buda 4 cylinder model YTU engine. Operating condition. Located central Wisconsin. Box 2303

BUCYRUS-ERIE 21-B Gas ⅝ yd. rope crowd shovel and 40' boom dragline including Type Y drag bucket. Wisconsin B-3 engine. Very good condition. Located Illinois. Box 2311

BUCYRUS-ERIE B-2 1 yd. steam shovel. Operating condition. Located vicinity Detroit. Box 2308

NORTHWEST MODEL 105 gasoline 45' boom crane. Twin City 6¼"x8" 4 cylinder engine. Very good condition. Located vicinity Duluth. Box 2298

BUCYRUS-ERIE 32-B gasoline shovel. 21'6" boom—16' dipper handle—⅞ yd. dipper. Chain Crowd. 40' boom clamshell equipment. Wisconsin D-3 6 cylinder 5"x6" engine. Electric starter. Extensively repaired. Excellent condition. Located Eastern Pennsylvania. Box 2307

BUCYRUS-ERIE GA-2 Gas-Air high lift shovel. 24' boom. 18'4" dipper handle. 1¼ yd. dipper. Waukesha 6¼"x8" 4 cylinder engine. Electric starter. Quantity spare parts included. Excellent condition. Located Eastern Pennsylvania. Box 2313

MARION MODEL 381 2 yd. shovel powered by Hesselman engine. Good operating condition. Located near Pittsburgh, Pa. Box 2304

UNIVERSAL GAS TRUCK CRANE. Full revolving. 20' boom. ⅝-yard Kiesler clamshell bucket with teeth. 4-wheel Mack truck. New tires last January. 4-cylinder 4¾"x6½" engine. Complete overhaul within last year. Ready to go to work. Located Chicago. Box 2324

BAY CITY—⅝-YARD GAS CLAMSHELL. Also drag shovel equipment. Located near Boston. Box 2330

P&H MODEL 400—Combination ¾-yd. gasoline shovel and crane. Crane boom 35' plus 10' extension. Waukesha 4-cylinder 5"x6¼" engine. Located vicinity Boston. Box 2334

P & H—MODEL 210—55' boom dragline including 1¼-yard Page bucket. Gas powered. Located South Dakota. Box 2329

BUCYRUS-ERIE 50-B, 2-yd. steam shovel. Good operating condition. Located Central New York State. Box 2333

BUCYRUS-ERIE GA-3—Gas-Air 1¼-yard high lift shovel and 45' boom clamshell machine. Electric starter. Single shaft cat. Waukesha 4-cylinder 6¼"x8" engine. Worked less than half the time since complete overhaul a year ago. Located New Jersey. Box 2326

BUCYRUS-ERIE D-2 — DIESEL DRAGLINE. Atlas engine. Located Texas. 40' Boom, 1¼ yd. Page Bucket. Field reconditioned. Excellent mechanical and operating condition. Box 2328

KOEHRING MODEL 501 gasoline 1¼ yd. shovel. Wisconsin 6 cylinder 6"x7" engine. Electric starter. Extensively repaired. Good operating condition. Located Texas. Box 2302

LORAIN UNIVERSAL MODEL 35—Dragline—28' boom. Waukesha 4½"x6" engine. Recently overhauled. Fine condition. Located California. Box 2290

BUCYRUS-ERIE 37-B Diesel dragline. New D-13,000 Caterpillar Diesel engine. Balance machine reconditioned. First class operating condition. New shovel equipment available at reduced price. Located Milwaukee. Box 2288

BUCYRUS-ERIE 43-B combination Diesel — shovel and clamshell—equipped with 22' boom, 17' dipper handle, 1¾-yd. dipper, 70' clamshell boom equipment, complete with tagline equipment, laggings, but no fairleads; powered with a Buda 6-cylinder Diesel engine, electric starter. No clamshell bucket. Box 2327

MEAD-MORRISON. ⅝ yd. Gas shovel. Very good operating condition. Located vicinity Boston. Box 2338

BUCYRUS-ERIE 55-B Diesel—80' boom dragline. Atlas 6 cylinder 8½x9¼" engine. Good operating condition. Located Eastern Pennsylvania. Box 2342

KOEHRING MODEL 601 Diesel—50' boom Dragline. Powered by Buda 4 cylinder 6½"x8¾" Diesel engine. Engine completely overhauled late last year. Located Central Illinois. Box 2343

NORTHWEST No. 3 dragline, 50' boom. Twin City oil engine. Raised portable gantry. Revolving type fairlead. 1500 watt Model E Kohler light plant. Fully enclosed house. Late model. Excellent condition. Located Pacific coast. Box 2344

NORTHWEST MODEL 105 GAS—40' boom dragline and clamshell, including Page "C" drag bucket. Climax engine. Reasonably good operating condition. Located Atlanta, Ga. Box 2345

BUCYRUS-ERIE — GA-2 — GAS-AIR 45' Boom Clamshell Machine. Good Operating Condition. Located St. Paul, Minn. Box 2346

BUCYRUS-ERIE — 52-B — DIESEL 2¼ yard Shovel and Dragline. Atlas engine. Good condition. Price recently reduced. Located Eastern Pennsylvania. Box 2347

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MARION MODEL 7, 1-yard steam shovel. Has not operated in the past five years. New flues recently installed in boiler. Located Buffalo, New York. Box 2354

BUCYRUS-ERIE—31-B STEAM SHOVEL. 22' boom, 15' dipper handle, 1-yard dipper. Now operating, can be demonstrated. Located Alabama. Box 2352

LINK-BELT, MODEL K-3. Gas crane. 50' boom. Also 2 extra 20' inserts to make 90'. Weight 67,000 lbs. Located St. Paul, Minn. Box 2356

BUCYRUS-ERIE. GA-2, Gas-Air. 1¼-yard shovel. Electric starter. Waukesha W.L. 4-cylinder 6¼"x8" engine. Single shaft cat. Extensively repaired recently. Located Texas. Box 2357

BUCYRUS-ERIE GA-3 Gas-Air 1¼-yd. shovel. Waukesha 4-cylinder 6¾"x8" engine. Good operating condition. Now operating Arizona. Box 2359

BUCYRUS-ERIE GA-3 Gas-Air 1¼ yard shovel. Single shaft cat. Electric starter. Waukesha 4-cylinder 6¼"x8" engine. First class condition. Located near St. Louis. Box 2363

BUCYRUS-ERIE 1035 Gasoline 40' boom dragline and clamshell, including 1-yd. dragline and clamshell buckets. 26" cat. treads. Waukesha engine. In first class working condition. Motor, Caterpillar mounting and all working parts recently checked. Located Nebraska. Box 2364

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5—MARION MODEL 37, 1¾-yard steam shovels, steel cab. Good working condition. Located Minnesota. Box 2362

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NORTHWEST Model 105 Gas 1 yd. shovel and 55' boom dragline. Reported very good condition and ready to go to work. Located Southern Michigan. Box 2379

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16'6" Chain Crowd Boom, 16-B	JA-38
18'6" Chain Crowd Boom, 21-B	JA-49
20'0" Chain Crowd Boom—42-B type for 34-B	JA-51
20'6" Shovel Boom—Steam H.L., 20-B New	JA-4
20'6" Chain Crowd Boom. 1030, New	JA-24
21'0" Shovel Boom, 37-B	JA-50
21'0" Steam Boom, 42-B	JA-54
21'6" Chain Crowd Boom, 37-B. New	JA-26
21'9" Steam Shovel H.L., 31-B	JA-5
23'6" Rope Crowd Boom, 37-B. New	JA-28
*24'0" Rope Crowd Shovel Boom, 43-B. New	JA-9
24'0" Erie type drag shovel boom, D-2	JA-52
26'0" Boom, Less shipper shaft brackets, 42-B	JA-53
26'0" Shovel Boom—High Lift, D-2	JA-13
26'0" High Lift Shovel Boom, 30-B. New	JA-36
*27'0" Rope Crowd Shovel Boom, 43-B. New	JA-16
28'0" Boom, 70-T, 70-C	JA-40
30'0" Steam Shovel Boom—H.L., 50-B	JA-18
31'0" Boom, 52-B	JA-41
35'6" Boom. H.L., 50-B. New	JA-43
150'0" Boom, Class 230	JA-44

DIPPER HANDLES

14'0" 21-B Dipper handle. New	H-30
19'6" Special 43-B Dipper handle complete. New	H-25
28'0" 80-B Dipper handle	H-28
46'0" 200-B Dipper handle	H-29

Asterisk (*) denotes more than one such item available.

DIPPERS

SMALL MACHINES

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⅝ Yd. Plate front, 14-B Dipper. New	D-13
⅞ cu. yd. 32-B Dipper	D-72
⅞ cu. yd. 21-B Dipper	D-88
1 Yd. Plate front, 20-B Dipper. New	D-42
*1¼ Ins. tooth, 42-B, 41-B, E-2 Dippers. New	D-44
1¼ Yd. Dipper. New. 30-B, 42-B, 41-B, E-2	D-54
*1½ Yd. 34-B Dippers	D-74
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2 cu. yd. 50-B Dipper. Used	D-69

LARGE MACHINES

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*2¼ yd. Vanderhoef Rock Dipper, 50-B, 52-B. New	D-75
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D-2 Erie type dragshovel dipper trip	DT-4

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44"x17', 75 h.p. locomotive, 125 lb. working pressure A.S.M.E. std. Will fit 68-C	B-13
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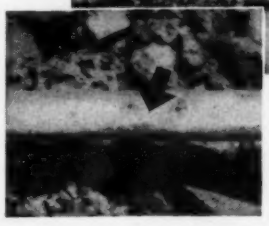

Above—down the hill, over the rocks, and into the muck

At left—you can just barely see the nicks on either side of the arrow

THIS tells about a three-conductor No. 00 Awg tellurium-rubber portable cable that supplies power to an electric shovel on a coal-stripping operation.

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Another view showing why such portable cable must be tough

GENERAL ELECTRIC

920-174

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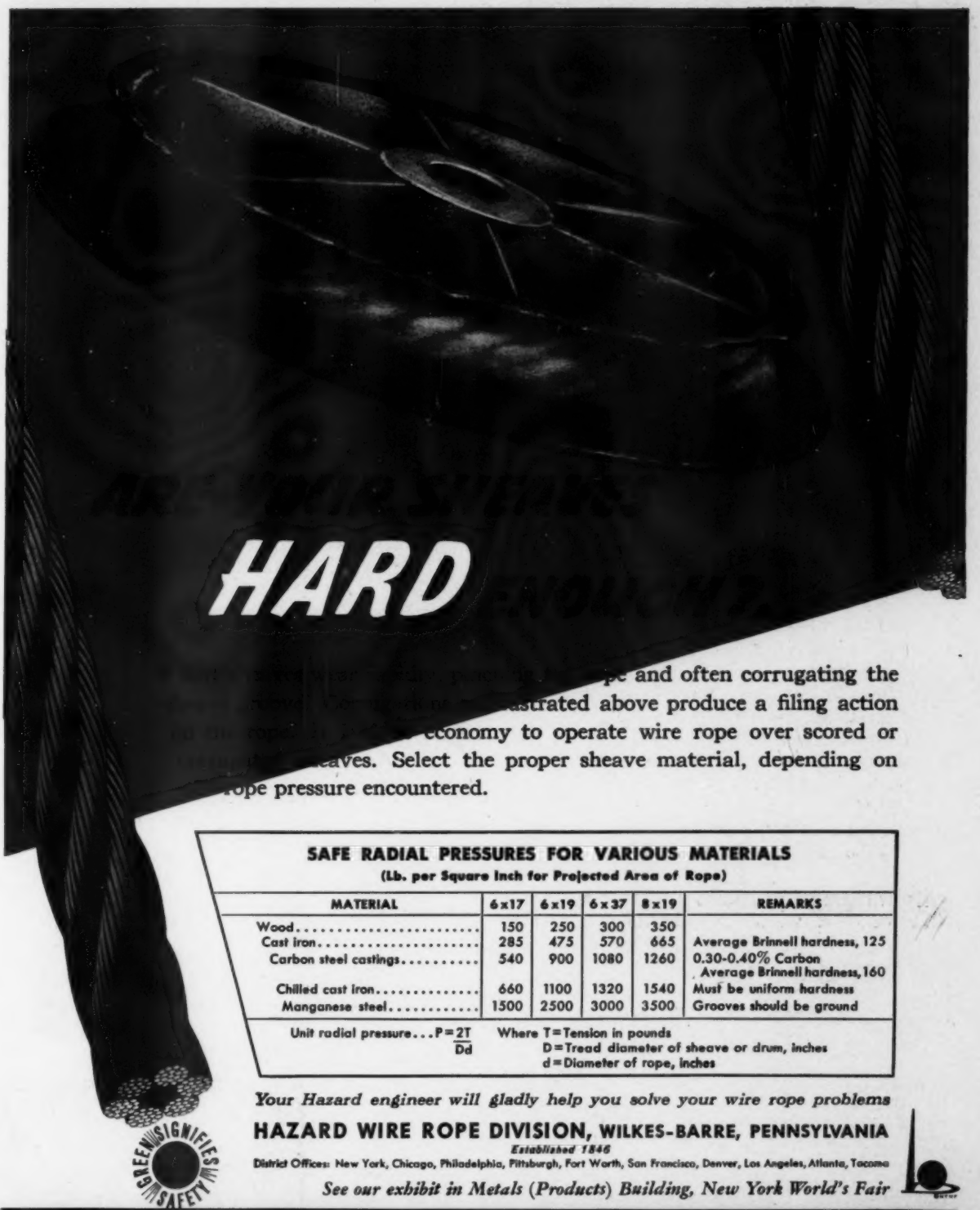

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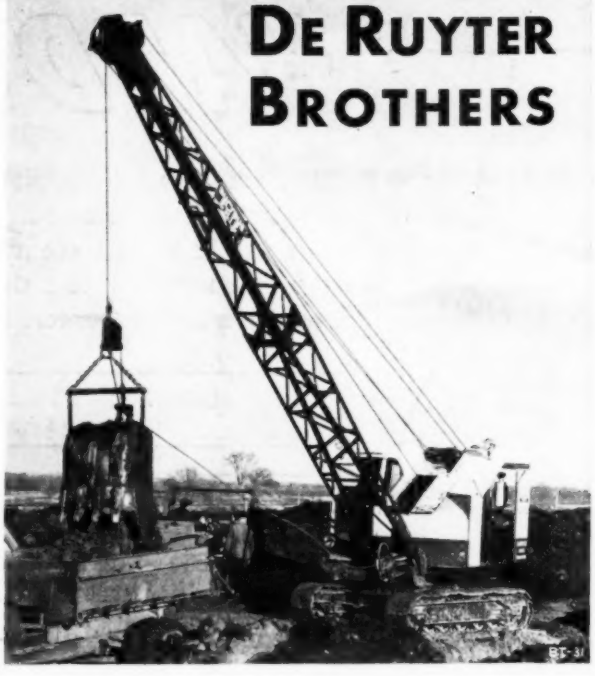
DE RUYTER BROTHERS

120 bank yards per hour is the average output DeRuyter Brothers get in ordinary dirt with their 20-B shovels. It takes them about 3 hours, using 3 or 4 men, to change front end equipment in the field. Of performance as both shovel and dragline, John DeRuyter says, "Easy to operate due to light pressure needed on operating levers. Moves about quickly with light ground pressure per square inch. Light weight for capacity helps in moving machine from job to job."



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